



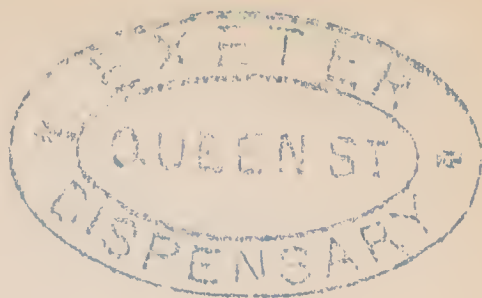
BRAITHWAITE'S RETROSPECT.

VOL. LXXXVI. JULY—DECEMBER, 1882.



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THE
RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND
PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M.D.

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN
AT THE LEEDS SCHOOL OF MEDICINE, ETC.

AND

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SYNOPSIS.

AN ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME, WITH OTHER SHORT ARTICLES FROM THE MEDICAL JOURNALS, SHOWING THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS DURING THE HALF-YEAR. ARRANGED ALPHABETICALLY.

AFFECTIONS OF THE SYSTEM GENERALLY.

CANCER AND CHANCRE.—The resemblance these two affections often present was well illustrated by two cases at Guy's Hospital, the patients lately attending on the same day. "One patient is a man about thirty years of age and unmarried. He has a thickening of the edge of his upper lip slightly to the right of the centre. In the middle of this thickening there is a superficial abrasion on which the secretion and epithelium cake and scale. The whole lip is a little swollen, but if you pinch it between your finger and thumb you feel a hard circular rim to the sore about the size of a sixpence. Now look at the other man. He is a respectable married man, upwards of fifty years of age. He has a superficial sore on his lower lip to the left of the median line. The surface is almost exactly similar to the other man's sore; it is cracked, and has a tendency to scab and scale. It, too, has a thickened rim, but if you pinch it you find the resistance less than in the other case; but so similar are the sores, that if their positions could be changed I think you would not be able to distinguish one from the other. Yet one is a cancer, the other the initial stage of syphilitic infection. How, then, can one distinguish them? First, the age and state of life make it probable that the young man's sore is a chancre, and the old man's an epithelioma; but thirty is not too young for epithelioma, nor is fifty proof against syphilis. Cancer occurs at the time when the tissues begin to wear out, and epithelioma especially, is almost always traceable to long-continued irritation. Next, the position is a distinguishing mark in these two cases, for epithelioma is rare on the upper lip. The position of the sore on the old man's lip is almost characteristic, it is just opposite the notch in his teeth made by his pipe. Further, he confessed to having always smoked unwaxed clay. If mere contact with porous clay is sufficient after years to set up cancer, you would con-

clude that there should be a corresponding sore on the upper lip; but the lower lip suffers most, for, owing to the weight of the bowl, the lower lip is pressed upon as well as rubbed." (Mr. R. Clement Lucas, p. 28.)

COCA AS A MEANS OF ASSUAGING THIRST.—The very remarkable effect possessed by the leaves of the *Erythroxylon coca* of relieving thirst that "I have both myself experienced and have observed while experimenting on others have led me to believe that a small ration of this leaf, if served out to bodies of troops marching through a country badly supplied with water, would prove of inestimable comfort to the men, and might even on occasion enable a general to carry an army across a country otherwise impracticable. In five minutes the sialagogue effect of the leaves while being chewed will manifest themselves. By abstaining from fluids during a meal, and having resort to the constant chewing of the leaf for some hours after, you will be able to obtain for yourself personal proof that the craving for water is materially lessened. As the fibre of the leaf becomes disintegrated by the act of mastication, the impalpable powder produced becomes mixed up with the saliva, and is involuntarily swallowed little by little till the entire mass placed in the mouth has disappeared." (Surg.-Major Edmonston Charles, M.D., p. 37.)

DISEASES PRODUCED BY SEWER GAS.—There are in the emanations from sewers the chemical products of the decomposition of animal matters, as sulphuretted hydrogen, ammonia, &c., to which the offensive smell is due. Now; these gases in themselves, though disagreeable and doubtless prejudicial to the health, are incapable unless highly concentrated, when they act as rapid poisons, of causing serious disease; and when diluted are chiefly important as indicating the fact of sewage emanation, and consequently the presence of the really injurious elements, which are themselves inodorous and imperceptible to our senses. These elements are probably the microzymes which germinate in sewage, especially when pent up and stagnating. These microzymes are of various kinds and properties. Firstly, the microzymes of putrefaction and the septic processes, which differ greatly in their virulence according to the conditions under which they are generated. To these may be ascribed the low sore-throat, the diarrhoea, and the many non-specific diseases which sewage emanations so often give rise to. The presence of these germs will also often convert any simple inflammation into a spreading or erysipelatous one. Next, in sewage gases the microzymes of various specific diseases, especially typhoid

fever and diphtheria, are liable to occur. These, no doubt, are not always present, and we often see instances of prolonged sewage contamination both of the air and drinking water of houses without these affections showing themselves; then, perhaps, the poison gets introduced and an outbreak takes place. But there is probably no town of any magnitude in England, and certainly no health-resort frequented by convalescents, where these poisons are not certain, sooner or later, to be introduced; and, given the conditions necessary for their germination and dissemination, we shall find these diseases endemic, with occasional epidemic outbreaks. The conditions which especially favour the development of these poisons are stagnation of sewage and want of free ventilation; indeed, many high authorities believe, as did the late Dr. Murchison, that under these conditions the poison of typhoid fever may be generated *de novo*; and recent researches on the microzymes of disease would give support to this view, as they show that these organisms are capable of being extraordinarily modified by the conditions under which they germinate, so that it is possible to conceive that microzymes generally harmless may, under favouring circumstances, develop into the germs of specific disease. Any system of drainage which causes the sewage to stagnate, or be pent up for however short a time, or under which the sewage gas is liable to be forced back into the houses, must be regarded as essentially faulty, and tolerably sure, sooner or later, to give rise to the most injurious consequences. (Editor of *Lancet*, Nov. 4, p. 769.)

EPITHELIOMA.—*Chlorate of Potash.*—It does not seem to be generally known that excellent results have been obtained from the application of powdered chlorate of potash to epithelioma. The surface of the ulcer should be well cleansed, and finely-powdered chlorate thickly dusted on it, and allowed to remain until the next dressing. The application may be made twice a day, the surface being cleansed before each application. This treatment is said to relieve the pain, to change the character of the morbid process, and to promote healing. The same powder may be used in cancroïd, chancre, and unhealthy ulcerations generally; and it has the merit of safety. (Practitioner, Sept., p. 215.)

MALARIA.—*Sulphur.*—The influence of sulphur compounds on organic life is familiar. It is seen only too clearly in the aspect of vegetation in many of our manufacturing districts, while the probable dependence of specific diseases on an organised contagium renders the familiar method of disinfection by sulphur another illustration of the fact. Observa-

tions on which we have lately commented afford strong reasons for believing that the active agent of malaria also consists of low organisms. It is, therefore, not surprising if sulphur emanations should be found to exert a marked influence on malaria, and some interesting facts have been lately collected by M. D'Abbadie, to show that this is actually the case. In Sicily, deposits of sulphur and intermittent fevers are both common, but occur for the most part at different elevations. In some places the sulphur deposits are found at a low elevation in malarial plains. In these districts the labourers in the sulphur works enjoy an almost complete immunity from intermittent fever, not more than 8. or 9 per cent. suffering, whereas of the inhabitants of neighbouring villages not less than 90 per cent. are attacked. In some travels in Greece, published by M. Fouqué, is an account of the ruins of a large city (Zephyria) situated in a marshy plain, in which it is impossible to pass the night without being attacked by ague. Three hundred years ago, it is said, the city contained forty thousand inhabitants and thirty-eight churches. Paludal fevers gradually destroyed the population. Twenty years ago only two hundred inhabitants remained, languishing and ill. They refused to leave the place, and the last of them died during Fouqué's visit. It is certain that malaria cannot have prevailed to the same extent during the period at which the town was in its rise and full development, and it is also noteworthy that the soil beneath the town contains abundant deposits of sulphur which was formerly worked in the vicinity, and the decadence of Zephyria dates from the discontinuance of these sulphur workings. Moreover, Fouqué has noted another instance of the same relation. The marshy plain of Catania is traversed by the Simeto, and is infected by fever. On the western border of this plain are some sulphur works, at which are a number of inhabitants who suffer little, although a village not far away is deserted. In Ethiopia certain elephant hunters expose their naked bodies daily to a fumigation of sulphur in the belief that this will preserve them from malaria, and certainly they enjoy an almost complete immunity from the disease, although some of the districts are so unhealthy that not long ago a whole caravan perished. (Lancet, Oct. 21, p. 676.)

Iodine.—Dr. R. B. Morison reports that he has treated with very great success two hundred and fifty cases of acute malarial poisoning by administration of tincture of iodine. The dose he employs is fifteen minims (not drops) three times a day, made up with sugar and gum and largely

diluted. It is taken a quarter of an hour before meals. In cases of chronic malarial poisoning he found by experience that iodine has no especial action. Constipation, pregnancy, or lactation do not contraindicate the use of the remedy. (Maryland Med. Journal.)

PAGET'S DISEASE OF THE NIPPLE.—It is of the utmost importance to distinguish true eczema of the breast from Paget's disease of the nipple, towards which the following Table may be of assistance:—

Paget's Disease of Nipple.

1. Occurs especially in women who have passed the grand climacteric.

2. Affected surface, in typical cases, of brilliant red colour, raw and granular looking after the removal of crusts.

3. When grasped between the thumb and forefinger, superficial induration often felt, as if a penny were laid on a soft elastic surface and grasped through a piece of cloth. (*Thin.*)

4. Edge of eruption abrupt and sharply cut, and often elevated.

5. Very obstinate, and only yields to extirpation or other treatment applicable to epithelioma generally. (Dr. T. McCall Anderson, p. 36.)

Eczema of Nipple and Areola.

1. Occurs especially in women earlier in life, and particularly during lactation, or in persons labouring under scabies.

2. Surface not so red and raw-looking, and not granular, but often punctated.

3. Soft, and no induration.

4. Edge not so abrupt, and not elevated.

5. Although sometimes obstinate, yields to treatment applicable to eczema.

RHEUMATISM.—*The Salicylates.*—The whole success of the treatment depends on the amount and frequency of the dose, and on this great stress must be laid, for many of the so-called failures of salicylate are clearly due to giving too little. I give 10 or 12 grains of salicylate of soda every hour till pain is relieved or singing in the ears comes on. Before using the salicylate it is well to give an aperient, if required. If this precaution be neglected headache or sickness is more likely to occur, in which case the salicylate should be stopped and an aperient given. Marked relief is generally experienced after the fifth or sixth dose, and slight tinnitus is frequently felt about this time. The further administration of the drug

must depend on circumstances and the susceptibility of the patient to its influence. It ought, however, to be pushed as rapidly as possible until pain is gone and temperature normal, after which it is well to continue the salicylate or, perhaps still better, salicine three or four times a day for a few days, temperature being meanwhile carefully watched and more frequent doses given if it should rise. This precaution will generally prevent relapses. (Dr. C. S. Clouston, p. 15.)

Salicylic and Carbolic Acids given Internally.—The comparative value of salicylic and carbolic acids given internally was the subject of a recent paper by M. Desplats of Lille. Each has an analogous action as a febrifuge, and the well-known effect of salicylate of soda in acute rheumatism can be produced, in some cases at least, by carbolic acid. The rectal administration of either may be substituted for that by the mouth when there are difficulties in giving it by the latter. Urinary disturbances are unimportant, and quickly cease if the dose is lessened. Albuminuria is rare, and passes off if the drug is omitted for a short time. M. Desplats mentions, for instance, a case of phthisis, in which, on account of high fever, two injections were given daily for two months, each containing half a gramme of carbolic acid, without any ill effect. In the discussion which followed at the Académie de Médecine, M. Dujardin-Beaumetz expressed the opinion that the free use of carbolic acid in injections entailed a considerable risk of pulmonary congestion, and this opinion was corroborated by several other speakers. (Lancet, Aug. 26, p. 326.)

RHEUMATISM AND GOUT.—*Counter-irritation by Blisters.*—It is generally admitted that the exciting cause of acute rheumatism, as of pleuritis or pneumonia, is a chill; that this effect is produced through the medium of the nervous system; and that, although the integument alone may be directly chilled, the deeply-seated internal organs also suffer. The immediate effect of cold upon the nerves of the surface is to lower their functional activity, and to increase the action of the nerves of the internal organ in relation with that part; endocarditis thus becoming the first step in the development of acute rheumatism after exposure to cold. If it be physiologically true that, when two parts of the same body are nervously in sympathy with each other, if we produce a powerful action in the nerves of one, we may withdraw vital energy from the nerves of the other, then it follows that, when a derivative in the form of a blister is applied in the nearest vicinity to the endocardial lining when in an inflamed state, it is but carrying into effect the principle that

counterirritation is the most effective plan available to alter the excited condition of nerve-centres, and so to influence motor, sensory, and trophic nerves. Further, if experience tell me that counterirritation over the heart is a potent remedy for the cure of acute rheumatism in all its phases, this fact will surely throw light on the nature of that disease. According to Dr. Peter Latham, "the treatment of diseases is in fact a part of their pathology. What they need and what they can bear, the kind and strength of the remedy, and the changes which follow its application, are among the surest tests of their nature and tendency." And Cullen, in the preface to his *Nosology*, says that "remedies cure diseases only in so far as they remove their proximate causes." When, therefore, a blister over the region of the heart cures endocarditis and its articular complications, it would surely not be unsafe to infer that the proximate cause is located in the heart itself. (Dr. A. Harkin, p. 19.)

SCARLATINA.—*Parasitic Nature of.*—In the *American Journal of Medical Science* for July, Dr. Ochterlony publishes a valuable paper based upon the careful study of fifty-eight cases of scarlatina occurring under his own observation. He advocates the theory of Eklund, of Stockholm, whose observations as to the parasitic nature of the disease he says he has repeated confirmedly. In the urine of scarlatinous patients there is constantly present an immense number of peculiar cellular bodies which have received the name of *plax scindens*. They consist of sporoidal cells, flat, oval, or round, and either colourless or yellowish white; they have a distinct cell-wall, and a nucleus of a clear brownish colour. Sometimes the nucleus contains a very minute nucleolus. As seen floating about in the fluid examined, they often exhibit rotatory or screwing or see-saw movements. It has been further observed that these little bodies multiply first by division of the nucleolus, then the nucleus divides, lastly the cell itself undergoes division; mycelium filaments never develop from these cells, nor do they arrange themselves in beads or in the zoogloea form. These bodies are always found in the blood of scarlatinous patients, as well as in the urine, but are not known to occur in any other disease. Hence it would appear that the infectious agent of scarlatina has been found. (Dr. J. A. Ochterlony, *Dublin Journal*, Sept., p. 195.)

SECRETION.—The complicated studies, of which I have attempted to give a brief sketch, have led to our forming certain clear general conceptions in reference to the process of secretion. They have brought into greater prominence the dignity, if I may use the expression, of the individual cell. The process

of secretion appears as the result of the combined work of a large number of these units. Each, after the manner of an independent organism, uses oxygen, forms CO_2 , evolves heat, and derives its nutriment from the medium in which it lives. and performs chemical operations of which the results only are imperfectly known to us, and which depend upon peculiar endowments of the cell protoplasm, of which the causes are hidden from us. So long as the protoplasm is living, the gland cell retains its power of discharging its functions, and in many cases does so, so long as the intercellular liquid furnishes it with the materials required. In some cases, however, the gland cells are specially sensitive to a variation in the composition of the nutrient liquid, certain constituents of which appear to stimulate the protoplasm to increased activity. In the higher animals the cells, particularly in certain glands, are in relation to nerves which, when stimulated, affect in a remarkable manner the transformations of their protoplasm, leading to an increased consumption of oxygen, an increased production of carbonic acid, an increased evolution of heat, and an increased production of those matters which the cell eliminates and which constitute its secretion. (Dr. Arthur Gamgee, *Lancet*, Sept. 2, p. 339.)

TYPHOID FEVER.—*The Organisms of.*—Maragliano of Genoa has published an important note on the uniform occurrence of organisms in the blood of patients suffering from typhoid. He has found them in the blood of the spleen as well as in that of the general circulation. The blood was obtained by means of a hypodermic syringe, the middle of which was passed through the abdominal wall into the substance of the spleen. Dr. Sciamano of Rome first showed that blood may be thus obtained from the substance of the spleen during life without any injurious consequences. The blood of the general circulation was taken from the tip of the finger. In each method every precaution was taken to avoid the accidental introduction of organisms. The examination, in this way, of fifteen patients gave the following result. At the height of the disease the blood of the general circulation contains micro-organisms both isolated and grouped. These consist, almost exclusively, of spherical bodies, which have a delicate contour, appear to be homogeneous, and are analogous to micrococci. Some of them are mobile. Similar organisms, again, were seen in the blood of the spleen, and in it, too, were others, rod-shaped, also with delicate outlines, perfectly corresponding to those described by Eberth and Klebs. During convalescence these micro-organisms lessen in number in both the splenic and systemic blood. When

quinine was given to the patient in large doses the organisms either disappeared from the blood, or were present in it only in small number. The blood from both the finger and the spleen was treated by the method of fractional culture, and a large number of rods were then obtained, similar to those seen in the fresh blood except that some of them were of greater length. The presence of such organisms in the blood of the spleen after death had been previously established by Sokoloff and Fischel, but Maragliano is the first who has demonstrated their presence in the splenic blood during life. He avoids the expression of any opinion as to their relation to the disease. (*Lancet*, Oct. 28, p. 718.)

Carbolic Acid.—M. Ramonet has recently published an account of the results he has obtained in Algeria by treating typhoid fever with carbolic acid, and the method of its use. Forty-one cases were thus treated, seventeen of which were severe, and two died, giving a mortality of five per cent., which must, under the circumstances, be considered remarkably low. The treatment consisted in injections of one gramme of crystallised carbolic acid in 150 grammes of water at the temperature of the room. One injection was given daily in mild cases, two in cases of greater severity, three in severe cases. A few drops of laudanum were sometimes added to help the retention of the enema. The time preferred for the injections was 11, 4, and 9. The injections were followed by a fall in the temperature, which might amount to 2°, and by a manifest diminution in the cerebral symptoms, headache, noise in the ear, and stupor, which might last for several hours. It is suggested that the favourable result is due in part to the antizymotic action of the carbolic acid. The dose should not exceed four grammes a day. The larger doses given by Desplats, 12 or 14 grammes, are harmful by their indirect effects. A tonic and stimulant treatment should always be associated with that by carbolic acid. (*Lancet*, Sept. 30, p. 543.)

Typhoid Fever and Diphtheria.—There is a close connexion in some respects between these two diseases. If any one, through impure drinking water, infected atmosphere, or other insanitary condition, is made ill, and tangible disease produced, you may have typhoid fever, diphtheria, or simply diarrhoea, as these diseases are produced most readily by imbibing faecal excretions. The origin of these diseases, in the great majority of cases, can be traced to a source of this kind, and not to infection. Moreover, these diseases have grown with the growth and developed with the development of our present water-closet system. By careful attention to

this source of infection and the water-supply of the house, you can almost certainly banish these diseases from a family. (Dr. Andrew Key, p. 10.)

AFFECTIONS OF THE NERVOUS SYSTEM.

ANGINA PECTORIS.—*Nitro-Glycerine*.—Dr. Murrell in a recent work brings together his already partly-published experiences of nitro-glycerine in the treatment of angina pectoris. Experiments show that its action is almost identical with that of nitrite of amyl; in small doses it gives rise to a throbbing and sense of fulness in the temples and head, a quickened pulse, perspiration, and sometimes nausea. A series of sphygmographic tracings exhibit the action of nitro-glycerine and nitrite of amyl on the pulse. The effect produced is the same in both instances, namely, quickening, diastole, and diminished tension. Nitro-glycerine takes a little longer in producing its action than the nitrite of amyl, but the full effect is maintained for a longer period, the influence of nitrite of amyl being extremely transitory. For this reason Dr. Murrell considers nitro-glycerine to be preferred. He gives notes of twelve cases, most of them uncomplicated by valvular disease or aneurism; in all of them nitro-glycerine diminished the pain, and in some afforded very permanent relief. In a few, cardiac complications were present, and more or less good effect was produced by the exhibition of the drug. In the rest the result was doubtful. With regard to the mode of administration, he recommends that a one per cent. solution should be used, and a half minim given every three hours, to be increased as required. Some patients are very susceptible to its action, while others bear well the largest doses. Dr. Murrell's results taken in combination with those of Mr. Green, published in the February number of the *Practitioner*, go to show that nitro-glycerine is a very valuable remedy, with the additional advantage that its physiological action is definite and known. (Dr. W. Murrell, *Practitioner*, Aug., p. 125.)

BROMIDES.—*Action of the various Bromides Compared*.—MM. Chéron and Fouques, having experimented at some length with the three well-known bromides (of potassium, sodium, and ammonium) have reached the following conclusions:—These salts act, in virtue of their bromine, as moderators of the reflex centres. The bromide of potassium joins to its sedative action on the nervous centres a depressing action on the muscular system; it is thus a *neuro-muscular* agent. The bromide of sodium has an action like that of bromide of potassium on the nervous centres, but

does not affect the muscular system; it is thus simply a *moderator of reflex action*. The bromide of ammonium has, in virtue of its bromine, an action on the nervous system similar to that of the other two, while it is also, in virtue of its ammonia, an excitant and diffusible; it is thus at once a *moderator of reflex action* and a *peripheral excitant*. Consequently, when it is desired to influence the reflex powers and the muscular system, preference should be given to the bromide of potassium; if, however, we wish to act only on the reflex centres, the bromide of sodium is indicated; is finally, if, leaving the muscular system out of consideration, it is desired to act on the nervous centres, to restrain the circulation and to effect a diminution in blood pressure, the bromide of ammonium will most probably give the required result. (Glasgow Med. Journal, Oct. p. 312.)

EARACHE.—Atropia.—The most effectual treatment, and the one which has stood the test of years, says Dr. Williams, in the American Chemists' and Druggists' Bulletin, is the local application of a solution of the sulphate of atropia. Not a single case but has yielded at once. The solution is to be simply dropped into the painful ear, and allowed to remain there from ten to fifteen minutes. Then it is made to run out by turning the head over, then being wiped with a dry rag. The solution may be warmed to prevent shock. From three to five drops should be used at a time. The strength of the solution must vary, according to the age of the child. Under three years, one grain to the ounce, and over ten years, four grains to the ounce of water. In grown persons, almost any strength may be used. All ages will bear a stronger solution in the ear than in the eye. The application should be repeated as often as may be necessary. Usually, a few applications will stop the pain. In acute suppurative inflammation of the middle ear, and acute inflammation of the external meatus, atropia will only slightly palliate the suffering, but in the recurring nocturnal earaches of children it is practically a specific. (Dr. A. D. Williams, British Med. Journal, Oct. 28, p. 836.)

ELECTRO-DIAGNOSIS.—New Medical Electrode.—In the scientific employment of electricity in medicine, and more especially for the purposes of electro-diagnosis, in addition to the currents from different batteries, certain accessories are essential. There must be: 1st. An electrode of suitable size and shape. 2nd. A method of graduating the strength of the current, by means of which the feeblest or the most powerful efforts of the battery may be obtained, or any intermediate grade that may be desired; this, moreover, must be effected gra-

dually, so as to avoid unnecessary sudden changes or shock. 3rd. A means of opening and closing or of interrupting the current. 4th. A mode of alternating or reversing the direction of the current. Dr. Bennett's electrode contains in itself all the essential elements for medical electrical appliances, and more especially for the purposes of electro-diagnosis (see *woodcut*, p. 68). It may be attached to either the faradaic or galvanic currents. When in the hand of the observer, all the accessories can be put in action by the movement of one finger, thus greatly facilitating the delicate manipulations of the investigator, and obviating the necessity of dividing his attention and altering his position, as he is compelled to do when working with an element-board. Finally, with this instrument, which can be carried in the pocket, the physician, provided he obtains a sufficiently powerful current, is independent of the imperfect construction of most of the apparatus now supplied to the profession, as all the necessary accessories he requires are contained in his electrode. The instrument is manufactured by Mr. Hawksley, Oxford Street. (Dr. A. Hughes Bennett, p. 68.)

FACIAL NEURALGIA AND HYSTERIA.—*Croton-Chloral Hydrate.*—For some time past I have used with special efficacy croton-chloral hydrate in nearly all the cases which have recently come under my observation of facial neuralgia (some seventeen in all), and my experience in successfully treating the affection by means of the drug have led me to give the results of my observation to the profession. I generally prescribe a full dose in this class of cases: \mathcal{R} . Croton-chloral hydrate, \mathfrak{z} ij.; glycerine, \mathfrak{z} ij.; aqua fontana, q. s. \mathfrak{z} iv. M. Fiat solutio. Sig., \mathfrak{z} j. ter. in die. In ordinary cases I give a teaspoonful three times a day. If the symptoms are quite urgent, I give a teaspoonful every two hours until the pain is relieved. In hysteria, especially when convulsions come on, it is specially valuable. My opinion is that the drug in small doses produces first anæsthesia of the head before the rest of the body is affected. In large doses the hypnotic effect is marvellous. Suffice it to say, its beneficial value is to be seen in all painful affections of the head. In just such cases I have observed its efficacy as a therapeutic and remedial agent. Permit me to add, its primary action is clearly marked in producing anæsthesia of the head, and only after this does its influence extend to the organs of the body. Finally, its true value can only be weighed, not by ordinary experience, but by the general verdict of the profession. (Dr. C. J. Fox, U.S.A., Edinburgh Med. Journal, May, p. 1025.)

HYSTERIA.—The principal elements in the systematic management of cases of aggravated hysteria, are:—The removal of the patient from unhealthy home-influences, and placing her at absolute rest. The production of muscular waste, and the consequent possibility of assimilating food by what have been called “mechanical tonics”; viz., prolonged movement and massage of the muscles by a trained shampooer, and muscular contractions produced by electricity. Supplying the waste so produced by regular and excessive feeding, so that the whole system, and the nervous system in particular, shall be nourished in spite of the patient. First, *the removal of the patient from her home-surroundings*, and her complete isolation in lodgings with only a nurse in attendance, is a matter of paramount importance. This is a point on which I am most anxious to lay stress, since it is the great crux to the patient and her friends; and constant appeals are made to modify this, which I look upon as an absolute *sine quâ non*. I attribute much of the success which I have been fortunate enough to obtain in my cases to a rigid adherence to this rule. In almost every instance of failure in the hands of others of which I have heard, some modification in this rule has been agreed to, in deference to the wishes of the friends; as, for example, treating the case in one room by herself in her own house, or in admitting the occasional visits of some relatives or friends. While, however, the patient is to be rigidly secluded, it is incumbent to secure the attendance of a judicious nurse, with sufficient intelligence and education to form an agreeable companion. To shut up a refined and intellectual woman for six weeks with a coarse-minded stupid nurse, can only lead to failure. I have had more difficulty in obtaining suitable nurses, sufficiently firm to ensure the directions being carried out, and yet not over-harsh and unsympathetic, than in any other part of the treatment. Whenever my case is not doing well, I instantly change the nurse—often with the happiest results. In addition to the isolation, the patient is put at once to bed, to secure absolute rest. In many cases, she is already bedridden; in others, there has been a weary protracted effort, and the complete repose is in itself a great gain and relief. Secondly, *Systematic muscular movement, having for its object the production of tissue waste*. This is administered by trained rubbers, and here again is a great practical difficulty. The so-called professional rubbers are, in my experience, worse than useless, and I have had to teach *de novo* a sufficient number of strong, muscular young women; and the aptitude for the work I find to be very far from common, since a large proportion of those I have tried have turned out quite unsuited for it. I cannot attempt any

description of this process. I need only say that it consists in a systematic and thorough kneading and movements of the whole muscular system for about three hours daily, the result of which at first is to produce great fatigue, and subsequently a pleasant sense of lassitude. Subsidiary to this is the use of the faradic current for about ten to twenty minutes, twice daily, by which all the muscles are thrown into strong contraction, and the cutaneous circulation is rendered excessively active. The two combined produce a large amount of muscular waste, which is supplied by excessive feeding; and, in consequence of the increased assimilation and improved nutrition, we have the enormous gain in weight and size which one sees in these cases, it being quite a common thing for a patient to put on from one to two stones in weight in the course of five to six weeks. The *feeding, at regular intervals*, constitutes a large part of the nurse's work. At first from three to five ounces of milk are given every few hours; and for the first few days the patient is kept on an exclusively milk diet. By this means dyspeptic symptoms are relieved, and the patient is prepared for the assimilation of other food. This is added by degrees, *pari passu* with the production of muscular waste by massage, which is commenced on the third or fourth day. By about the tenth day the patient is shampooed for an hour and a half twice daily, and by this time she is always able to take an amount of food that would appear almost preposterous, did not one find by experience how perfectly it is assimilated, and how rapidly flesh is put on. It is the usual thing for patients to take, when full diet is reached, in addition to two quarts of milk daily, three full meals, viz.—breakfast, consisting of a plate of porridge and cream, fish or bacon, toast and tea, coffee and cocoa; a luncheon, at 1 p.m., of fish, cutlets or joints, and a sweet, such as stewed fruit and cream, or a milky pudding; dinner at 7 p.m., consisting of soup, fish, joint, and sweets; and, in addition, a cup of raw meat soup at 7 a.m. and 11 p.m. It is really very rare to find the slightest inconvenience result from this apparently enormous dietary. Should there then be an occasional attack of dyspepsia, it is at once relieved by keeping the patient for four-and-twenty hours on milk alone. (Dr. W. S. Playfair, p. 50.)

HYSTERICAL PARALYSIS AND POLIO-MYELITIS ANTERIOR (INFANTILE PARALYSIS).—*Differential Diagnosis between.*—Polio-myelitis anterior, or, as it is more commonly called, “infantile paralysis,” is more especially liable to be confounded with hysteria, as the symptoms and progress of the case are very similar in both. The paralysis resulting from this

serious organic disease of the cord attacks the adult, both in its acute and chronic forms, much more frequently than is generally believed. It is obvious that to make a clear distinction between these two disorders is of the highest importance, as the treatment suitable for the benefit of the one would be useless, or even injurious, if applied to the other. When polio-myelitis involves any reflex arc, the *reflex* motions associated with the track interfered with are destroyed. In the case, therefore, of paralysis of the lower limbs, resulting from this disease, all the cutaneous and tendon reflexes are absent. In hysterical paralysis, on the other hand, these phenomena are not abolished. They are usually normal, and not seldom are actually exaggerated in degree, so that not only are those which naturally exist much increased in intensity, but new reflexes not found in health are developed. Here, then, is a marked distinction between hysteria and polio-myelitis. The *electrical reactions* are for the most part definite and conclusive. In acute polio-myelitis the excitability of the affected nerves is very rapidly lost, so that in from a week to ten days after the onset of the paralysis the response is altogether abolished to the electric stimulus. Very soon afterwards the muscles are affected, and then ensues all the characteristic quantitative and qualitative changes met with in neuro-muscular affections. In the chronic forms of the disease the same takes place, but in a more gradual and progressive manner. In hysterical paralysis, on the other hand, the electrical reactions remain practically normal. In some cases there may be quantitative *increase* of response, indicating hyper-excitability of the nervous system, but these changes are slight in degree, and there are never qualitative alterations. In very chronic cases also, in which the patient has been bedridden for years, there may be quantitative *diminution* of response due to prolonged disuse of the muscles, or to increased resistance to the current from an augmented deposition of subcutaneous fat as the result of want of exercise. In such cases the loss is never complete, and the change is one of degree only, and not of character. Thus in electricity we have an agent which enables us in the large majority of cases to detect with accuracy and certainty between polio-myelitis and hysteria, and, so far as my own experience has gone, I have never met with a case of the former which did not present some characteristic abnormal reactions, nor an instance of the latter in which these were developed. (Dr. A. H. Bennett, Lancet, Nov. 18, p. 842.)

HYSTERICAL SPINE.—We are all aware that, when any of the tissues of the body are the seat of acute or chronic inflam-

mation, the pain which results is augmented by pressure; but the pain we are considering, and which is alleged by the patient to be "all down the spine," is not increased by pressure. For instance, if the patient is placed face downwards on a firm mattress or couch, the whole weight of the surgeon's body transmitted to the spine by means of the open hand will give no pain; but, on the contrary, if the finger be drawn lightly over the spinous processes, from the cervical portion down to the sacrum we shall have a scream or sob, together with considerable cringing or flinching. So the apparent suffering of the patient bears no proper proportion to the pressure exercised. Another test producing a very characteristic symptom of these cases is to tap gently the spinous processes as the patient stands erect before you. The same flinching will be observed, and by these means one is often enabled to more or less localise the pain. The seat of this will generally be found in the lumbar region, especially if we can trace any uterine irregularity arising from any cause whatever. The second symptom is deformity. This may exist in various degrees, from being hardly noticeable to an extent simulating the worst form of lateral curvature; but, unlike that far more serious disease, the hysterical deformity can in a minute be reduced, although when the pressure or manipulation necessary for this is removed the deformity returns; yet for the moment it has vanished, and we have satisfied ourselves that there is no structural change. These two symptoms will generally be found sufficient to determine the nature of the case, especially if our diagnosis be assisted by the existence of any of those morbid conditions of the emotional centres so well known and recognised in the phenomena of hysteria. (Mr. Osman Vincent, p. 301.)

LOCAL PALSIES.—*Hypodermic Injection of Large Doses of Strychnia*.—Some years ago I published in these reports what seemed to me to be proof of the advantage of this practice in certain local palsies. I have reason to believe, however, that the full benefit of the drug is often not obtained through fear of inducing its poisonous effects, and I venture once more to call attention to the subject. The following case will exemplify its usefulness. James Irvine, a blacksmith's striker, aged 52, was admitted into the Royal Southern Hospital under my care on December 8, 1881, suffering from complete paralysis of the left and almost complete of the right arm. The paralysis was caused by the use of crutches owing to an accident to his right ankle. There was much wasting of the muscles of the arm and shoulder. He had double wrist drop, and could only pronate with great diffi-

culty, especially on the right side. There was numbness of the left arm, only relieved by holding it to the fire, and then having it well rubbed. The right biceps tendon was very rigid, and the arteries degenerated. Strychnia was prescribed first in five and after a few days in ten minim doses three times a day, and the muscles were Faradised. The right arm soon showed some signs of improvement, but the left seemed hopelessly paralysed, and I began to despair of any relief being obtained for it. On the 19th 5 min. of liq. strychniæ were ordered to be injected into his arm, midway between two of his doses of medicine. On the 24th the amount was increased to $7\frac{1}{2}$ min., and on February 6th to 10 min. On the 11th the injection was made twice daily. About this time some slight indication of improvement for the first time manifested itself. It was, however, very slight, consisting of a faint attempt at grasping and a feeble movement of the fingers, while the hand was prone. The wrist remained as much dropped as ever. The amount injected was raised to $12\frac{1}{2}$ min. on the 13th, and to 15 min. on the 17th. On this day the improvement was marked. He could almost straighten the fingers when the hand was prone, and could slightly abduct the thumb. The injection was further increased, first to 18 and eventually on the 30th to 20 min. twice daily; and on the 10th he was dismissed quite well, with the use of the hand and arm completely restored. He had been taking 10 mins., i.e., $\frac{1}{12}$ gr. three times a day by the mouth, and having 20 min. ($\frac{1}{6}$ gr.) injected twice a day, without experiencing on any occasion the slightest poisonous effect. (Dr. Wm. Carter, Liverpool Med. Chir. Journal, July, p. 246.)

LUMBAGO, PARAFFIN-POISONING, COLIC, ANGINA.—*Hypodermic Injection of Amyl-Nitrite*.—I have administered amyl-nitrite hypodermically thirty or more times during the past eighteen months. In all cases, a ten per cent. solution in rectified spirit was used. In no case did any untoward inflammatory or suppurative symptoms occur afterwards. The action of the drug was immediate in every case, the subjective phenomena being like those experienced when using the ordinary methods of administration. The spirit solution appears to be an excellent preparation for use, as a small quantity kept in an ordinary stoppered bottle for some months retains its full efficiency at the present time. The dose usually administered has been ten minims of the solution, equal to one minim of amyl-nitrite. In lumbago, where the patient is seen at the commencement of the attack, and the disease is not of long standing, the drug given in this manner instantly relieves the symptoms; a patient who is unable,

previously to its administration, to bend the trunk without the most exquisite pain, five minutes afterwards can do so quite readily. In a case of paraffin-poisoning, where the patient was in a state of collapse and almost pulseless, one administration (inhalation having been ineffectually tried) brought on an immediate resumption of cardiac function, the man speedily recovering. Its action in this case would, I apprehend, be due to the relief momentarily given to the congested centres by the peripheral hyperæmia induced. In another case, one of duodenal colic, the patient was found rolling on the floor from the acuteness of the pain; when, on injecting fifteen minims of the spirit solution, the pain disappeared as if by magic, and the patient was at once able to resume his ordinary position. The value of this drug by ordinary methods of administration has already abundantly demonstrated how great a boon the discovery of Dr. Lauder Brunton is in the hands of the profession, notably in cardiac angina; and I feel confident that its utility may be still further enhanced by giving it as here recommended, hypodermically. (Dr. J. J. Frederic Barnes, *British Medical Journal*, June 3, p. 817.)

MIGRAINE, EPILEPSY, ETC.—*Nitro-Glycerine*.—Dr. Hammond, in a short paper upon the therapeutic use of nitro-glycerine, says that he has used it a great deal. He always employs a one-per-cent. solution in absolute alcohol, one drop of which is quite enough for a commencing dose; this may be repeated in half an hour, if desirable. The effects are similar to those of nitrite of amyl, only more persistent; there is arterial fulness, with throbbing, and flushing of the surface. It is very serviceable in migraine, when the latter is due to anæmia, or at least associated with it. Du Bois Reymond thinks that all migraine is anæmic; Mollendorff believes that all migraine is hyperæmic; Eulenburg and Gutman believe that some cases are attended with hyperæmia, while in others anæmia is present. Examination of the retina with the ophthalmoscope will show if there is congestion or anæmia on the affected side; pressure upon the carotid of the affected side will afford relief in congestive cases; exacerbation will follow in anæmic cases. Nitro-glycerine should be given in drop doses of the one-per-cent. solution every half hour until flushing of the surface and increased arterial pulsation show that the physiological action of the remedy is being induced. Everything depends upon the diagnosis; harm will be done in hyperæmic cases. The author has used the drug in epilepsy, especially in cases of *petit mal*, in conjunction with the bromides; the *modus operandi* in these cases is obvious. (Dr. W. A. Hammond, *New York Med. Journal*, Dec., p. 662.)

TETANUS.—*Urari.*—The action of urari is transitory, and seems to be exercised upon the motor nerves only, the sensory remaining unaffected. When pushed to its toxic extent, paralysis of the voluntary muscular system follows, and death ensues from paralysis of the respiratory muscles. In tetanus the voluntary muscles are violently convulsed; they are in a true state of cinesia, resembling that artificially produced by strychnia. Is it not rational to infer that an agent which induces an opposite condition—that of acinesia—should be antagonistic to it? May it not be possible to induce a partial acinesia, to diminish the excitability of the spinal cord by urari, without pushing it to the extent of producing paralysis; or perhaps even justifiable if, by establishing that condition, we might overcome this hyper-irritability of the cord, knowing that in artificial respiration we might still hold the reins of life in our hands? Might we not, perhaps, adopt this ultra treatment as a *dernier ressort*, where a certain and terrible death stares the sufferer in the face? Urari seems to exercise a specific action in diminishing the frequency and violence of the tetanic spasms; secondly, that its acinetie properties are not always *immediately* developed upon its absorption, being more marked by comparison of its daily effects than by that of shorter intervals; thirdly, that it is not a cumulative, a sufficiency—nearly half a drachm—having been injected during a period of eleven days to produce a fatal effect, were it so; fourthly, that four grains may, in an adult, be exhibited at intervals in the twenty-four hours without danger to life. The drug was first employed in the form of discs prepared by Messrs. Savory and Moore, and subsequently as an aqueous solution, prepared by myself, of the commercial urari procured for me by Messrs. Thacker and Hoffe, of Dublin. (Dr. Leslie Maturin, p. 58.)

TOOTHACHE.—*Iodoform.*—Schaff recommends iodoform on account of its gently caustic action as an anodyne application to exposed tooth-nerves. The circumstance that a single or repeated application of iodoform does not produce any irritation, much less any inflammation of the periosteum, and the double function of the remedy as a cleansing and disinfecting agent, make it especially appropriate as a caustic, particularly before the introduction of a temporary filling. The author uses a paste consisting of Iodoform powder, 60 grs.; kaolin, 60 grs.; carbolic acid, 8 grs.; glycerin, q. s.; oil of peppermint, 10 gtt. Triturate the iodoform, kaolin, and oil of peppermint with enough glycerin to form a thick paste. (Practitioner, Aug., p. 142.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ANEURISM.—*Use of Dr. Fleet Speirs' Artery-Constrictor.*—

Mr. Bryant employed this instrument in popliteal aneurism, the operation being under strict antiseptic precautions. The operation was performed on May 12th, and consisted of four stages: 1, The exposure of the artery by a clean incision; 2, The constriction of the artery with the largest sized loop of a Speirs' constrictor; 3, The obstruction of the lumen of the artery by breaking up its inner and middle coats by means of the constrictor, and the subsequent formation of a blood-clot at the injured spot; and 4, The washing of the wound with an antiseptic lotion composed of three drachms of liquor iodi to a pint of water, and the careful adaptation of its edges with its subsequent dressing. It should be added that the artery was very large, and apparently thickened. The case demonstrates very forcibly the value of Dr. Fleet Speirs' artery-constrictor in bringing about the occlusion of an artery, even when that artery is thickened and enlarged, and the patient is not one of the most favourable for operative interference; since, in the case related, the wound healed rapidly and kindly, without pain, swelling, or overaction, indeed, without any of the many complications by which the repair of deep wounds is liable to be retarded. That a like result would not have been brought about had the artery been ligatured with prepared catgut, or any other animal ligature, I am not prepared to assert, for my own experience could supply the possibility; but such an argument can in no way destroy the fact that in this case, in which a novel method of occluding a large artery has been employed, the very best kind of repair followed, and was completed in the very best way. The method of Dr. Speirs brings about an immediate division, and a certain amount of recurvation of the inner and middle coats of the artery, the external coat being left intact; and, later on, the formation of a clot at the injured part, with the exudation of plastic lymph, and, as a consequence, the permanent occlusion of the injured vessel. Indeed, the method seems to do to a vessel by design what surgeons at times meet with in practice as the result of an accident, and it apparently does this well. I believe that we have, in this instrument of Dr. Speirs, a valuable means at our disposal for bringing about the occlusion of a large artery in continuity; and, although I am not disposed to make too much of the success of one case—the first, I believe, of the kind which has occurred in this country—I am bound to say that Dr. Speirs reports to me that in his own city of New York it has been

employed with success in at least three cases of carotid, one of femoral, and one of brachial aneurism. From the success of this case, I shall certainly employ the instrument again; and I would like my brother surgeons to give the method a trial. The instrument may be had at Messrs. Krohne and Sesemann's, 8, Duke Street, Manchester Square. (Mr. Thomas Bryant, p. 204.)

HÆMOSTATIC AND SURGICAL DRESSING.—*The Puff-Ball.*—

The puff-ball which grows close to the roots of trees in some of our woods, is, when mature and fit for use, almost as large as a man's head; it is enclosed in a thin capsule which must be removed, it can then be torn in pieces and used either as a styptic or for applying any required surgical dressing. The puff-ball undoubtedly possesses the qualities here claimed for it, and this I assert positively, both from my own experience and that of others. It is, however, its hæmostatic properties that seem to me to be so especially valuable; it has the power of stopping instantly even the most violent external hemorrhages upon which iron, matico, turpentine, &c., have exercised their properties in vain. (Mr. E. Thompson, p. 216.)

LIGATURE OF ARTERIES IN THEIR CONTINUITY.—*Choice of Material.*—We may assume, at the present day, that the choice is narrowed to some form of animal tissue as silk, catgut, or the strip of ox-aorta recently advocated by Mr. Barwell. Whichever is used, it is cut short, and the wound closed over the foreign body, in the hope of obtaining primary union. The best material is that by which this requirement is most surely fulfilled, and which, at the same time, effects a permanent barrier to the circulation. Silk, even the best, and with the most careful antiseptic precautions, cannot be relied on for the former purpose. Though the peritoneum has the power of encapsuling it, the connective tissue only does so as a lucky accident, and, more often than not, strangulation of the outer coat of the vessel proceeds to ulceration, by which the ligature is cast loose. By means of catgut, a true subcutaneous ligature can be insured; but the second point, that of permanent occlusion of the vessel, has not been so certain. I am well satisfied with stout common gut of good quality, improved by long keeping in carbolic oil, as a material for ligature which leaves little or nothing to be desired; and it is a matter of surprise to me that such fancy methods of treatment of aneurism as Esmarch's bandage, from which I have seen fatal-disaster in the most simple cases, should still find a place for discussion. (Mr. Bennett May, p. 209.)

LIGATURES. — *Method of Applying to Veins.* — A punctilious regard to cleanliness may obviate the employment of the redundant ceremonial of full antiseptic measures. Either the spray or the irrigator may be used. I have, when operating by ligature, had equally good results from both. I have also had perfect freedom from suppuration and sepsis, without either spray or irrigator, from an application to the skin of a thick ointment composed of wax, olive and eucalyptus oil and carbolic acid. This smeared over the parts forms a coating sufficiently thick, at the temperature of the skin, to prevent the contact of air with the punctures. In regard to the operation itself, it should, after the plan of Ricord and Duncan, be subcutaneous, and the ligature of catgut. The ligature should be very fine: No 1 size only. This for two reasons: because it requires less force to cause complete occlusion of a vessel with a thin than with a thick ligature; and a thick ligature embraces a greater portion of tissue, and therefore causes a greater amount of bruising and destruction. The disadvantages and even the danger, in the case of arteries, of using thick catgut, have been pointed out by Mr. Barwell and Mr. French. The ligature should not be in that rigid condition in which it usually is from being kept in carbolic oil, as, after soaking in the fluids of the wound, it becomes softened and elastic, and in that condition stretches after tying, which, be it ever so little, is sometimes sufficient to prevent perfect occlusion. To soften the ligatures, they may be soaked in a 5 per cent. solution of carbolic acid before being used. I find that the addition of a small quantity of eucalyptus to the carbolic oil in which they are usually kept makes them soft and elastic. In this condition, as in tying with horsehair, a double turn must often be made in the first knot, to prevent it slackening before the second can be brought to fix it. The vein only, with as little surrounding tissue as possible, should be included in the ligature. Not only is there less tissue bruised or devitalised, but less force is required to produce complete occlusion, just as an artery is more easily controlled by pressure on its bared trunk than over super-imposed structures. With this object I employ two needles—a long sharp-pointed one, and a blunt grooved one to act as a director. The sharp needle is first thrust underneath the vein, and its point brought out through the skin on the opposite side. It is then withdrawn a sufficient distance in its track to allow of its point being passed over the vein between it and the skin. To serve as a guide, the grooved director is now inserted in the puncture of exit from which the needle has just been withdrawn, and the needle, now pushed on, meets the groove of

the director and comes out at its former aperture. (*See diagram, p. 213.*) After these tracks were made, I formerly used blunt needles and a director to pass the ligature round the vein and tie it. Latterly I have used a triangular pointed needle five inches in length, with an eye in the middle and a bulbed extremity. It is thinner in the shaft than at the point, so that the ligature threaded through its centre passes without hindrance along with it into the puncture. The needle, with about eight inches of ligature, is thrust under the skin beneath the vein and brought out on the other side, as just explained. It is pushed on till the ligature appears, one end of which is then withdrawn sufficiently to allow it to be passed over the vein, guided out by the director as described, and pushed on till the other end of the ligature can be pulled through. (*See diagram, p. 214.*) The ligature now forming a loop around the vein is drawn out of the needle, tied in a single knot, and that end of it which was first passed through is drawn back by the needle to the other side of the vein, and the knot passing under the skin is then tightened. To tie again and complete the reef knot, the eye of the needle bearing the ligature must again be pushed through, and the knot tied as in the first instance; the other ligature is brought back in the needle, which may now be entirely withdrawn, and the knot made fast. The ends are now cut off as near to the knot as possible; this is done by pulling gently on the one-half of the ligature, and cutting it off close to the skin, so that it at once disappears beneath it when divided; the other end is similarly dealt with. The vein is now tied with a reef knot, which with both of its ends is beneath the skin. In this proceeding it will be observed that till the completion of the operation the needle is never withdrawn entirely out of the wound; and that it is by means of the eye carrying the ligature from one side to the other that the knot can be correctly and securely tied subcutaneously. To ensure more complete and permanent adhesion, as well as to avert clotting in the vein, two ligatures must be applied, at intervals not exceeding an inch. The lower ligature to be first applied, and before tying the knot of the upper one all the blood in that part of the vein between the two points of occlusion must be pressed out, so that the sides of the vessel are brought into the closest contact. (Dr. Henry Sydney, p. 211.)

NÆVI OF THE FACE.—*Electrolysis.*—In some cases of nævi where you cannot use the ligature, nor the actual cautery, nor caustics, try electrolysis. The charming part of the treatment by electrolysis is, that you can regulate the amount and extent of destruction by including a few more cells within the

circuit or by reducing the number. And at the same time the action is not confined to the superficial part of the growth, but may be made to extend through the whole depth by pushing the needles or electrodes farther into its substance. Large deep-seated nævi on the extremities or trunk may be made to slough out *en masse* by a current from thirty to forty cells; and, with the same instrument, by merely reducing the number of cells a modified action, extending through the whole nævus, may be effected, as in the cases quoted. That there is a tendency to recurrence after such partial treatment as is here discussed there can be no doubt. But then one must here recollect that it is only recommended for such cases as these on the face, in which total destruction for various reasons is quite inadmissible. (Mr. H. H. Clutton, p. 217.)

NEW VEGETABLE STYPTIC.—*Fowlwort*.—A recent number of the *Neue Freie Presse* states that during the French expedition to Mexico a plant was discovered, called by the natives by a name which may be rendered as “Fowlwort” (*Tradescantia erecta*, Jacq.), which has the property, when chewed or crushed, of stopping any hemorrhage. A specimen planted in 1867 by the discoverer, in his garden at Versailles, has not only flourished, but flowered and fruited, without having its peculiar properties as yet appreciably diminished. Although no exotic, or remarkable for particular beauty of bloom, it nevertheless deserves a wider extension on account of its valuable properties, especially as its acclimatisation may be regarded as having been fully established. Its action exceeds that of all styptics as yet known, as, for example, perchloride of iron, and it can, moreover, be very cheaply procured. (*Lancet*, Oct. 28, p. 716.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

APHONIA OF SINGERS AND SPEAKERS.—For this affection Dr. Corson (*Revue Medicale*) recommends the patient to put a small piece of borax (two or three grains) into the mouth and let it dissolve slowly. An abundant secretion of saliva follows. Speakers and singers about to make an unusual effort should the night before take a glass of sugared water containing two drachms of potassium nitrate (saltpetre) in order to induce free perspiration. In similar circumstances this gargle may also be used: Barley water, six ounces; alum, one or two drachms; honey, half an ounce; mix, and use as a gargle. Or, again, an infusion of jaborandi, made by putting two scruples of the leaves in a small cup of boiling water, may be drunk in the morning before getting up. The free sweating is said very quickly to restore the strength of the voice. (*Practitioner*, Aug., p. 140.)

BRONCHO-PNEUMONIA. — *Iodoform*. — Professor Semmola, of Naples, has published an account of the treatment of caseous broncho-pneumonia by iodoform, and has added to it an urgent entreaty to practitioners in all countries to repeat his experiments, as he believes this to be one of the most important uses to which iodoform can be applied. During the last three years he has treated many cases in this manner, not only of broncho-pneumonia, but of bronchial catarrh, asthma, &c. Expectoration lessens, often very rapidly, and with it the cough and paroxysms of dyspnoea, perhaps partly in consequence of the local anæsthetic action of the drug. The secretion in the bronchial tubes, and in small cavities, is, he believes, disinfected. Pyrexia gradually lessens, and he thinks that the fall in the temperature is to be ascribed to this disinfection of the secretion and putrid material, which is being constantly absorbed from foci of softening. The local process seems to be favourably influenced, and in some cases a condition very near the normal seems to be regained, of course only in cases of broncho-pneumonia in the first stage. The dose employed varied between five and fifty centigrammes daily, according to the varying tolerance of the digestive and nervous system. It is best borne made up into pills, with extract of gentian or some other extract. Small doses answer best, which can be repeated as frequently as every one or two hours. Inhalations may also be employed, the iodoform being dissolved in turpentine, and this inhaled three or four times a day. Semmola disclaims any intention of bringing forward iodoform as a remedy for tuberculosis or all caseating affections of the lungs. Several cases, supposed to be tubercular, have, however, been recently published in which remarkable results have been said to follow the administration of iodoform. Mook gave it in doses of one centigramme, and observed the signs of cavities gradually to disappear. Baeler observed what were believed to be the symptoms of tubercular meningitis to disappear under its use. In neither of these cases, however, does the diagnosis of tubercle appear to rest on any strong grounds. (Lancet, Aug. 26, 1882, p. 326.)

CHRONIC BRONCHITIS.—*Inhalations*.—Antiseptic inhalations in chronic bronchitis, as counteracting the tendency which retained sputa seem to have in propagating the disease from one portion of the lung to another, are most useful. This is probably the principal way in which carbolic acid, terebene, creosote, eucalyptol, and benzoin do good under such circumstances. The marked usefulness of Friar's balsam (tinct. benzoin), in the dressing of wounds for centuries, seems to

throw light on its renewed importance now as an antiseptic both in surgery and physic. (Edinburgh Med. Journal, May, p. 1005.)

Carbonate of Ammonia Sachets.—M. Melsens having observed the good effects of the atmosphere of a stable on those suffering from pulmonary diseases, which are rightly attributed to the emanations of carbonate of ammonia, he thought that continued, yet moderate, respiration of this salt might be useful in other affections of the respiratory organs. After a serious attack of bronchitis, he decided on trying on himself the effects of carrying a little bag round his neck containing little pieces of carbonate of ammonia. From the first day the amelioration was felt, and the cough soon disappeared entirely, while often persons who suffered from chronic bronchitis also obtained relief. The use of little bags of carbonate of ammonia are intended to produce the same result as the air of a stable or a gasworks. (Medical Press, Oct. 18, p. 337.)

EMPHYEMA.—*Antiseptic Incision and Drainage.*—In all cases of local or general empyema, free incision, without any special precautions, should give better results than those left to natural processes, because the cases are earlier relieved, and the opening is made convenient for effective drainage. Dr. Fuller, in 1872, had seen no fatal cases treated under him by this method since he had been connected with St. George's Hospital. But a free incision soon heals, until it is merely a narrow sinus through the chest-wall, not large enough to allow free escape from the pleura. The pus collects, and, by reflex irritation of the pleura, is soon largely increased in amount. This tendency can be perfectly met by the use of Chassaignac's drainage-tube. No counter-opening is necessary, the original incision being always at the best available site for drainage. The end of the tube should reach any pocket of pus that may exist. As to the site for drainage, the most dependent part of the pleura, when the body is supine, is the tenth rib at its angle. An incision made along its upper border, just outside the angle, is as low in the chest as it is usually safe to go. The lower intercostal spaces are widest, and posteriorly more so than at the axilla, admitting a full-sized drainage-tube. The lower angle of the scapula rests on the eighth rib, I should incise just outside the angle of the rib, never above the eighth space; and if the effusion be very large, should prefer the tenth. The drainage-tube requires careful management. If it be left in too long, the sinus cannot close; and, even if the empyema be practically cured, the granulation tissue along the tube secretes a good

deal of pus. On the other hand, it should not be withdrawn too soon. In one of my cases I thought it produced dyspnoea, and unwisely withdrew it the second day after the operation, but reintroduced it two days afterwards, with relief of a great deal of pus. On the seventh day after the operation the empyema was replaced by a serous discharge, and I again discontinued the drain; the wound did not heal until seven weeks after the operation. Had I drained for a fortnight, I believe it would then have been cured in a third of the time. (Mr. F. Richardson Cross, p. 84.)

HOOPING COUGH.—*Ergot.*—In this disease a vast number of remedies are useful, but after a pretty extensive trial I am inclined to regard ergot as the best and safest. Up to the time when I began to use ergot I regarded the combination of bromide of potassium and tincture of belladonna, or sulphate of zinc and tincture of belladonna, as the best remedies with which I was acquainted, but that sometimes necessitated the belladonna being pushed to its physiological action before the disease would yield. That was sometimes not unattended with danger in young children unless they were carefully watched, which cannot be easily done in hospital or dispensary practice. Ergot seldom fails to cure whooping cough in from one to three weeks; the cases that are longer in getting better are those complicated with bronchitis, or with troublesome bronchial catarrh. I give from four to fifteen minims of the liquid extract every three or four hours to children of three months and upwards. (Dr. Dewar, p. 92.)

Dr. Evetzsky states that beef-tea disguises the taste of the liquid extract of ergot almost entirely. (New York Med. Journal, Jan.)

NASAL CATARRH.—*Ergot.*—This troublesome complaint, which has hitherto resisted all remedies, if taken in its early stage may be cut short by a full dose of ergot—repeated if necessary. (Dr. John Dewar, p. 94.)

NASAL POLYPUS.—*Tannin.*—M. Stanislas Martin states that in six cases he has known injections of officinal tannin, one part to ten of distilled water, morning and evening, prove very efficacious in mucous nasal polypi. If they be continued for some time a tannate will be formed, which will become detached, restoring respiration by the nostrils. (Practitioner, June, p. 457.)

PHTHISIS.—*Germicide Treatment of Phthisis.*—Inhalations are the natural vehicle of pulmonary germicides, and inhalations have been already much resorted to in the earlier and ruder times of empiricism. Medicated vapours of various sorts

were well known to the practitioners of the last century, and even of an earlier time; coming down to sixty years ago, we find a work published in 1823 by Crichton, "On the Treatment and Cure of Pulmonary Consumption, and on the Effects, in that disease, of the Vapour of Boiling Tar"—a disinfectant vapour. It may be that we shall return to those practices, now that they have ceased to be empirical; and it may be that faith in their soundness will procure for them a more patient trial, and lead to a more appreciable success. We have already mentioned the indication of treatment derived from the observations of Ehrlich; no disinfectant with an acid re-action—a sweeping exclusion—need be tried, inasmuch as the outer coat of the bacillus is impenetrable to even strong acids. Alkaline disinfectants are of most promise, but, when we call to mind all the circumstances of the bacilli in the tissues, we should not be too sanguine. It is not always an easy matter to eradicate the relatively large and relatively accessible fungi of tinea or pityriasis, and the bacilli of tubercle are many times more subtle, and infinitely more closely identified with the very life of the tissues. It looks as if it might be easier to destroy the delicate living mechanisms of the patient than to destroy the crass vitality of the parasite. The most useful indications from parasitology will doubtless be in the way of prophylaxis. Dr. Koch has indeed already directed attention to the dangers arising from dried phthisical sputa becoming mixed with the dust of the air, and he has suggested that the expectorations of the phthisical should be summarily reduced to an innocuous condition. Here also the inevitable empiricism has forestalled the conclusions of science; it has been an immemorial practice in Italy to disinfect everything in a house where a consumptive has died, and even to destroy articles that have presumably been contaminated. Relatives who accompany those unfortunate patients in search of health have occasion to know the Italian practice, and they have been apt hitherto to set it down as a meaningless and costly superstition. The only other practical suggestion that has arisen out of the parasitic theory of tuberculosis is that we should look after our milk supply, lest the milk of tuberculous cows should be mixed therewith. (Editor of Med. Times, p. 121.)

Continuous Antiseptic Inhalations in Phthisis.—There are many antiseptic substances, the vapour of which may thus be continuously, or almost continuously, diffused into the air that is breathed. Your choice may depend somewhat on the taste of the patient; or you may change the applications, from time to time, until you find out, in each case, which is most useful, and best supported by the patient. Some simply

keep the sponge (or tow) moistened with carbolic acid; others prefer creasote, and others use spirit of turpentine. I have used all these alone, as well as in combination. I have also used eucalyptol, thymol, terebene, camphor, fir-wood oil (*oleum pini sylvestris*), solution of tar in rectified spirit, tincture of benzoin, tincture of iodine, &c. Of all these I prefer creasote; but I also frequently use carbolic acid and eucalyptol, with which I sometimes mix a little camphor. Turpentine is a useful addition as an astringent, where there is profuse secretion or a tendency to hemorrhage. Camphor has been said to be a very powerful antiseptic, but it has the objection of diffusing itself very rapidly, and is unpleasantly pungent and penetrating. I have also found it a very convenient plan to mix these substances, such as creasote, carbolic acid, eucalyptol, or turpentine, with equal parts of spirits of chloroform. It helps to diffuse and vaporise these substances, and it is itself somewhat of an antiseptic; and it has also a soothing effect on the often irritable bronchial mucous membrane. I have often seen a patient tormented with cough at night, so much so as to be unable to get any sound sleep, obtain perfect relief from this distressing symptom by using at bedtime one of these inhalations in an instrument of this kind. The quantity required for this purpose is often quite inconsiderable; it is rarely necessary to use more than twenty minims of a mixture of equal parts of creasote and spirits of chloroform dropped on the sponge at a time, and renewed occasionally as it becomes exhausted; and it is often desirable to begin with very small quantities, until the patient gets used to the vapour. Five drops of the mixture may be dropped on the sponge at a time, and gradually increased to fifteen or twenty. One of the advantages of the little inhaler I have described to you is that, being perforated all over, the access of air is unimpeded, while the vapour diffuses itself freely into the immediately surrounding atmosphere. With more solid inhalers, patients will often say they feel "stifled," and refuse to use them. The substances I have named are, I believe, the best for continuous, or almost continuous, inhalation; for occasional inhalation you will find a weak iodised vapour often very useful; and even a very dilute chlorine vapour is well borne by some patients. (Dr. I. Burney Yeo, p. 118.)

The instrument, which I have designated the "naso-oral respirator," fulfils conditions which intermittent spraying or the inhalation of medicated steam can never do. The fluids used for inhalation purposes belong to the class of volatile antiseptics, such as carbolic acid, creasote, terebene, eucalyptus oil, &c. In ordinary cases I prefer a mixture of

creasote (three-fourths) to carbolic acid (one-fourth, Calvert's No. 1). This is, as a rule, wonderfully well borne even in the case of children. I have already briefly reported the case of a child, æt. 7, who inhaled pure creasote almost continuously for several weeks without difficulty or inconvenience. This child, it may be added, now continues well and strong, and has not inhaled for over a year. Eucalyptus oil, though bland and unirritating, is very apt to produce sickness and nausea. Toxic symptoms have never been noted in any of my cases after the continuous inhalation of carbolic acid or creasote for prolonged periods, nor have I heard of a single instance of their occurrence in the practice of other practitioners. The urine generally remains free from traces of the antiseptic inhaled, but on two or three occasions very minute traces of carbolic acid have been found after the use of this drug. (Dr. G. Hunter Mackenzie, p. 123.)

Inhalation of Sulphurous Acid Vapour in Phthisis.—Sulphurous acid is, as all are aware, useful in the treatment of parasitic diseases—either of the animal or vegetable character—and I have used sulphur vapour in cholera with considerable advantage. For these reasons I have lately tried it in pulmonary consumption, and with advantage, though at first discouraged by reason of its irritative properties and obnoxious odour. Since, however, combining it as follows, these difficulties have passed away. These preparations, which may be had from Mr. Bullock, of Hanover-street, are:—No. 1. *Vapor. Acid. Sulphurosi c. Ol. Pini. Sylv.*—℞. Ol. pini sylvestris, ℥ 80; kaolin, gr. 20; acidi sulphurosi, B.P., ad ʒj. M. ft. inhalatio. Five to ten drops to be inhaled three times a day. No. 2. *Vapor. Acid. Sulphurosi c. Ol. Eucalyptii.*—℞. Ol. eucalyptii, ℥ 80; kaolin, gr. 20; acid. sulphurosi, B.P., ad ʒj. M. ft. inhalatio. No. 3. *Vapor. Acid. Sulphurosi c. Benzoin.*—℞. Acidi sulphurosi, ʒss.; tinct. benzoin. comp., ʒss. M. ft. inhalatio. In these inhalations the essential or specific ingredient is the sulphurous vapour, the oils, though possessing intrinsic virtues, being here mainly used to disguise the odour and lessen the irritation of the sulphur. The kaolin helps to mix the oils, but is not necessary, for a little spirit of wine might answer the purpose. In commencing these vapours, the benzoin combination should have a first trial, and it is well to use a wire or perforated flexible zinc inhaler, carrying a bit of sponge on which the fluid can be dropped. This obviates the fatigue attending the use of hot-water inhalations. The sponge should not be allowed to touch the lips. (Dr. D. H. Cullimore, p. 127, and Med. Press, Oct. 18, p. 343.)

Iodoform.—Many pathologists having now for some time held the view, that tuberculosis was an infectious disease, depending on the presence of micro-organisms (a view which had received strong support by Koch's important researches), and that tuberculosis, phthisis, and scrofulosis were closely allied, if not identical pathological processes, the author was led, guided by the excellent results obtained in the local treatment of scrofulous diseases by iodoform, to try the administration of this drug in phthisis. This experience extended over more than six months; and the results so far obtained were satisfactory. The iodoform was given in the form of inhalation, and internally in the form of pills (one grain per dose), mixed with creasote and dextrine. The best results were obtained in cases of incipient and acute phthisis; in chronic cases, the results were less satisfactory; in a few cases of laryngeal phthisis, the local application of iodoform powder to the ulcerated surface of the larynx was followed by immediate relief, and clearing of the ulcers—without, however, producing healing of the ulcers. The conclusions arrived at were these. 1. Iodoform is well borne by the patient, without producing nausea or gastric irritation. 2. Owing to its anæsthetic properties, it relieves the irritation in the throat, and the cough, especially in incipient phthisis. 3. In some cases, it increased the digestive powers and appetite, and relieved the vomiting. 4. It reduces slightly the temperature in cases of phthisis with raised temperature. 5. In no case have any bad results followed the inhalation of iodoform. 6. Hæmoptysis forms no counter-indication for its administration (in some cases, hæmoptysis entirely disappeared on the administration of iodoform). 7. In incipient phthisis, iodoform seems to arrest the disease. (Dr. Dreschfeld, Brit. Med. Jour., July 29, p. 169.)

RESPIRATOR FOR ANTISEPTIC INHALATIONS.—Dr. Hunter Mackenzie's "Naso-oral Respirator" is the most complete and effectual instrument for continuous antiseptic inhalations, though it has been named by some the "portable coal-box." It is in metal, and shaped like a chloroform-inhaling mouth and nose-piece: it has four rubber valves, two on the sides opening outwards, and two inwards from the antiseptic chamber; this is in front on the truncated nose-piece, and an oval perforated rimmed plate fits on it, and can be taken off for the purpose of saturating a contained sponge. The valves enable the patient to breathe without trouble in the ordinary way, and secure the immediate exit of expired air. Messrs. Meyer and Meltzer have lately introduced a much lighter and more elegant form of this respirator in pink vulcanite, which leaves nothing to be desired. (Dr. E. Mackey, p. 133.)

TUBERCULAR BACTERIA.—Following close on Dr. Koch's announcement of April 10, of the bacillus of tubercle and its infective property, comes another announcement by Prof. Baumgarten, of Königsberg, of the independent discovery of an organism in tubercle, which may or may not turn out to be the same as the organism detected by the staining method of Dr. Koch. It appears that Prof. Baumgarten, writing a year and a half ago on a supposed identity, or at least equivalence, between the *Perlsucht* of cattle and the tuberculosis of man, had prophesied that a parasitic agent would one day be found in the bovine as well as in the human tuberculosis, and, as we read him, the same parasitic agent in both. It cannot be said that he has found bacilli in the *Perlsucht* itself, but he has found them in the tubercular nodules of rabbits that had been inoculated therewith. They are present in innumerable quantities; and wherever the tubercular formations extend, there also are the organisms. They resemble mostly *Bacterium termo*, but they are in general somewhat longer, and more slender, less sharply outlined, and, instead of being slightly rounded at the ends, they form knob-like or wedge-like expansions; they are not unfrequently regular cylinders; they seldom occur in pairs, and never in zoogloea forms. Finally, they are distinguishable from the bacteria of putrefaction (and also from other species of bacteria) inasmuch as they cannot be detected by staining, even when Koch's method of illumination is applied. "The only method," says Baumgarten, "by means of which I have succeeded in bringing the tubercle-bacteria accurately under observation is to treat the sections with very dilute soda or potash." In sections of somewhat older spirit-preparations, even that method fails to detect them; but they are easily found in specimens taken from newly killed animals and cut into sections after having been twenty-four hours in absolute alcohol. This new claimant to the honours of tubercular discovery shows that Schüller's spherical micrococcus cannot have been the true tubercle-parasite, just as Dr. Koch himself has disclaimed Schüller's organisms. Curiously enough, he makes the same distinction as Koch did between Aufrecht's bacillus and his own. Aufrecht's bacillus was half as broad as it was long; whereas both Koch and Baumgarten point out, in the respective cases, that their bacilli are five or six times as long as they are broad. But Koch at the same time admits that his bacilli varied in length between the diameter of a red blood-corpuscle and one-fourth of the same; and, in Baumgarten's woodcut, there are certainly more of the bacilli short and thick, than there are of them long and slender. Whether, in these variations in the size of the

tubercle-bacillus, there lies a means of reconciling the discrepant accounts of different observers, we will not undertake to say. But the knob-like expansions of Baumgarten's bacilli—unless, indeed, they were spores—and the method of detecting the presence of the organisms in the tissues, are two points which make that observer's discovery independent of the discovery of Koch. (Editor Medical Times and Gazette, May 13, p. 502.)

It has long been known that certain bacteria, vibrios, etc., find a proper *nisus* in the degenerations of tubercle; but they have always been regarded as effects, and not causes, of pulmonary consumption; so that in Koch's finding a parasite (vegetable or animal) in tubercular matter there is no new thing, though it may have a new form, and has certainly been honoured by a new name. Further, it is also well known to physiologists and others who have given special attention to the subject before us, that brain, pus, cheese, putrid muscle, etc., when inoculated will produce morbid results in various organs, *which cannot be distinguished from those produced by the inoculation of tuberculous matter*. How, then, can the morbid products of the inoculation of tubercle be considered as in any sense *specific*? In my humble judgment, all the results obtained by the inoculation of the so-called *bacillus*, as practised by Koch, were much more likely to be pyæmic in their nature, and such as the introduction of *septic* matters into animal bodies will generally produce, rather than anything unique or specific. (Dr. Wm. Dale, Med. Times, May 13, p. 507.)

TUBERCLE-BACILLUS.—*Ehrlich's Method of Detecting in the Sputum.*—Sputum is spread in thin layers upon cover-glasses and allowed to dry in the air. It is next exposed to a considerable degree of heat, either by being shut up in a properly constructed hot-box for twenty minutes or so, at the temperature of 212° Fahr., or—and this answers the purpose quite as well—the cover-glasses, with the dried sputum upon them, are passed three or four times quickly through the flame of a gas jet or of a spirit lamp. In this way the sputum is thoroughly set. The next step is to stain the sputum with any one of certain of the aniline series of dyes. Fuschine and gentian violet are two of those which Ehrlich has used. These colours are handled in this process in precisely similar ways, and, therefore, it is necessary to describe the use of only one of them. A saturated alcoholic solution of fuschine is made. This is added, in certain proportions, to a saturated watery solution of aniline prepared in this way:—Five cubic centimètres of aniline are added to one hundred cubic centi-

mètres of distilled water. The mixture is allowed to stand for about twenty minutes, and, during that time, it should be frequently shaken. The aniline water is then passed through a moistened filter, and the filtrate should be as clear as good drinking water. It contains from three to four per cent. of aniline. To thirty cubic centimètres of this clear filtrate are added thirty drops of the saturated alcoholic solution of fuschine. A glistening metallic film will probably now appear upon the surface of the mixture, but should that not happen, then more of the solution of fuschine must be added until the film is clearly marked, for its presence is the sign that the staining mixture is of the proper strength. If after sixty drops of the fuschine solution have been added to the aniline water without a distinct film having appeared, the desired result can be obtained with certainty by allowing the mixture to evaporate in the air for some hours. The cover glasses, with the layers of sputum upon them prepared in the way already described, are allowed to float for thirty minutes, sputum downwards, upon the surface of a sufficient quantity of the staining fluid poured into a suitable vessel. When removed from the fluid at the end of that time, the sputum will be seen to be stained with a deep red colour. The next step in the process is to remove by far the greater part of this deep red colour. That is done by washing the cover-glasses, with the sputum upon them, in a mixture of one part of the acidum nitricum, B.P. (not acidum nitricum dilutum) and two parts of distilled water. After the washing with nitric acid there should be, at most, a slight white-pink tinge visible to the naked eye in the sputum. The acid is washed out by dipping the cover-glass in distilled water. If the specimen were now examined microscopically, and if bacilli of tubercle were present in it, they would be seen, here and there, as red rods, and perhaps in clusters also, upon a colourless or whitish-pink ground. When the bacilli are numerous they could be well seen, even with so faulty a background of colour as this, but when they are few they might easily escape notice, unless their red colour were thrown into relief, as it were, by the use of some contrast colour. With this object, the process of staining is completed by allowing a drop or two of a saturated watery solution of methylene blue to fall upon the sputum after the nitric acid has been washed out with water. The blue colour is washed off to a certain extent with water, just enough of it being left to give a distinct light blue tint to the sputum. The specimen should be examined, while still wet, with the microscope. If tubercle-bacilli are present, they will be seen as red rods upon a blue ground. All the constituent

parts of the sputum and all other known bacteria take the blue coloration; the tubercle bacillus alone retains the red colour due to the staining with the fuschine and aniline dye. In the specimens which I prepared in this way before the Section of Pathology at Worcester, the bacilli were seen in large numbers. That is not usual. In examining a specimen of sputum for these organisms, one may reasonably expect to see one or two of them in a microscopic field, if they be present in ordinary numbers. When they are present in large numbers a cheesy-like portion of the sputum should be searched for and examined. The tubercle-bacillus measures in length from $\frac{1}{7140}$ in. to $\frac{1}{11600}$ in. These measurements have been made on several occasions by Mr. E. Nelson. A power of 500 diam. is sufficient for the purpose of easily verifying the presence of this organism. Ehrlich's process, properly used, in the way now indicated, will demonstrate the presence of the bacillus of tubercle in sections of tissue just as clearly as in sputum. (Dr. G. A. Heron, Assistant Physician to the City of London Hospital for Diseases of the Chest, Brit. Med. Journal, Oct. 14, p. 735.)

Dr. Heneage Gibbes's New Method of Staining.—The following will be found an easy and simple method of demonstrating the tubercle bacillus. It takes a short time to carry out, and the bacillus is stained so deeply, and is differentiated so fully from the surrounding substance, that it can be seen with the greatest ease with an ordinary quarter-inch object-glass and daylight. It is necessary to make two staining fluids—one, magenta, which stains the bacillus; the other, chrysoidin, which stains the surrounding substance, but not the bacillus. The magenta solution is made thus: Magenta crystals, grammes 2; pure aniline, c.c. 3; alcohol, sp. gr. .830, c.c. 20; aq. dest., c.c. 20. Dissolve the aniline in the spirit; rub up the magenta in a glass mortar to a fine powder; add the spirit gradually while stirring until all the colour is dissolved; then add the water slowly, still stirring, and put in a stoppered bottle. The chrysoidin solution is made by rubbing up the colour in a mortar with distilled water until it is saturated, and then adding a crystal of thymol dissolved in a little absolute alcohol, to make it keep. Neither of these solutions should be filtered when made. The chrysoidine should be kept in a dark place. A dilute solution of nitric acid is also required, which is made by diluting one part of commercial nitric acid with two parts of distilled water. (Becker and Co., 34, Maiden Lane, Covent Garden, make up both magenta and chrysoidin solutions from aniline colours manufactured by the Badesche Aniline Fabrik, and their

solutions may be thoroughly depended on.) The object of the process is to stain the sputum, or section, as the case may be, with a colour which the dilute nitric acid will remove from everything but the tubercle bacillus, and the subsequent staining with chrysoidin is only required to throw up the stained bacillus and make it more prominent. In Dr. Ehrlich's process, the stain for the bacillus is too faint, and the vesuvin, used to stain the ground substance, too opaque; consequently, the bacillus appears a faint pink colour on a dense yellowish brown ground, and is not easily made out without high power or special illumination. His method of dissolving the aniline in water, in which it is very sparingly soluble, is also open to objection, as it is very apt to vary in the amount taken up by the water. The manner in which the stains are used is as follows. A little sputum is spread on a cover-glass and allowed to dry; it is then passed three or four times through the flame of a small Bunsen burner, and left to cool. A few drops of the magenta solution are filtered into a watch-glass, and the cover-glass, with the sputum downwards, placed on it, care being taken that no air-bubbles are under the cover-glass; it is allowed to remain from fifteen to twenty minutes. It is then put into the dilute nitric acid until all colour has been removed, which will take a few minutes; but it may be left for ten minutes without damage. It is then washed in distilled water until all the acid is removed, and placed in a few drops of chrysoidin solution which have been filtered into the bottom of a watch-glass; a few minutes will suffice to stain it deeply. It must then be again washed in distilled water, and the superfluous water drained off on filter paper; it is then placed in absolute alcohol, to remove the remainder of the water, and dried thoroughly in the air. When dry, a drop of Canada balsam solution is placed on the cover-glass, and it is mounted in the usual manner. Glass funnels should be used to protect the fingers in filtering the stains. Sections of hardened tissues are treated in the same manner, with the necessary modifications, and the bacillus is shown by this method equally well in specimens hardened in spirit or chromic acid. (Dr. Heneage Gibbes, Curator of the Anatomical Museum, King's College, British Medical Journal, Oct. 14, p. 735.)

Baumgarten's Method of Detecting.—For the demonstration of tubercle bacilli in the sputum of phthisical patients Baumgarten recommends the following method as more convenient than those of Koch and Ehrlich. A little of the sputum is dried on the cover-glass, as recommended by the latter, and then treated with potash—one or two drops of a 33 per cent.

solution of caustic potash added to a watch-glass of distilled water. The tubercle bacilli can then be readily seen with a magnifying power of 400 or 500 diameters, and a little pressure renders them still more distinct from the enclosing detritus of tissue. In order to preclude the possibility of confounding the bacilli of tubercle with those of other species, the cover-glass may be raised and placed aside until the layer of fluid on its under surface is dry, and then passed two or three times through a gas flame, and then on it may be placed a drop of an ordinary watery solution of aniline violet or any other nucleus-tinting preparation of anilin. All the putrefaction bacteria then appear under the microscope as an intense blue or brown (according to the testing agent and its strength), while the tubercle bacilli remain absolutely colourless, and can be seen with the same distinctness as in the ordinary potash preparation. The whole process does not occupy more than ten minutes. (Lancet, July 15, p. 72.)

TUBERCULOUS INFECTION.—*Koch's Experiments.*—Four guinea-pigs were inoculated with bacilli of the fifth generation produced in 54 days from tuberculous matter originally derived from a human being. In each case the infected animal sickened and lost flesh, and being killed at the end of 32 or 35 days, strongly pronounced tuberculosis was found in every instance. The situation chosen for the injection of infective material was found to exert no influence on the result. The abdomen, the anterior chamber of the eye, and other places were selected, with always the same ultimate consequences ensuing; and in cases where check experiments were made by injecting natural, healthy blood serum into animals at the same time as others were infected with cultivated bacilli, it was found that while the latter sickened and became tuberculous, the former remained unaffected. In another series of experiments the sputum of phthisical patients was obtained and dried thoroughly for six or eight weeks. At the end of this time, being suspended again in solution and injected into guinea-pigs, the latter became rapidly emaciated, and in every respect similarly diseased to those animals directly infected with bacilli obtained at once from tuberculous masses, or through successive cultivations. The importance of this particular observation will be at once apparent. It proves that hitherto unsuspected danger lurks in the neighbourhood of every consumptive individual, and that ordinary precautions are insufficient to protect susceptible persons from the influence of such producing agents of a dire and rapidly destructive disease. (Dr. Koch, p. 106.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

HARELIP.—In performing the operation for the cure of hare-lip there are several points which, if attended to, add much to the probability of a successful result. The lips should be thoroughly freed from the gums in order that there may be as little tension of the parts as possible, and in doing this the edge of the knife should be directed towards the upper maxilla. In this way the hemorrhage is reduced to a comparatively trifling amount. The edges of the cleft should then be put on the stretch by means of two pairs of spring forceps, one pair being placed at the upper or nasal extremity, and the other at the lower border.—A tenotomy-knife is now made to transfix the entire thickness of the lip close to the nose, and is carried downwards as far as is necessary. After this the flap is freed at its upper extremity. A similar operation is performed on the other side. In cutting the flaps a good slice should always be removed, as it is better to take too much than too little, and the reasons for this are not far to seek. There is a larger breadth of rawed surface to unite, and consequently there are a greater number of vessels capable of anastomosing with each other. Any bleeding point is more easily seen and the flow of blood arrested, while the sutures get a better grasp of the tissues.—Various plans have been devised to prevent the after-formation of a notch in the lip. Some surgeons recommend bringing down both flaps, uniting their cut surfaces to one another, and removing the redundancy with the scissors. Others make their incisions concave, with the concavity towards the cleft—their aim being to give a fulness to the lip. A better plan than either of these is to bring down a good thick flap from one side, carry it along, and unite it to that of the other. The lip has thus a full amount of prolabium, which gives it an even and natural appearance. The flap which comes in contact with its lower border counteracts the natural tendency to shrink upwards, and helps to keep the raw edges of the cleft in apposition and so promote their union.—In regard to *sutures* there is much difference of opinion. Some still prefer the needles, but as a general rule their use is going out. They leave a mark, and if there is much tension the pressure of the silk which is wound round them is apt to cause ulceration, as well as to impair the vitality of the tissues in their neighbourhood. They have the additional disadvantage of greatly concealing the lip, and the thread forms a nidus for particles of food or other substances capable of undergoing decomposition. Horsehair and catgut have each their advocates, but the latter has more pliability than the former, and admits of a nicer adaptation of the parts. The durability of gut, and

its power of resisting the action of the tissues, are greatly increased when it is previously steeped in a solution of chromic acid. Hair is apt to cut, but it does very well for the prolabium, where it is not subjected to much strain, and I have found fine silk thread to be equally reliable. Silver wire, though not without drawbacks, forms an excellent suture, and when it is used the ends should be laid flat on the lip. By this means they are not so apt to catch, and thus lead to derangement of the cut surfaces.—A *curved needle* is preferable to a straight one for passing the sutures through the tissues. It adapts itself more readily to the position of the parts, and it should be made to penetrate through nearly the entire thickness of the lip. The object of this is to bring the whole of the raw edges in accurate apposition. It is a good plan to pass the first suture at the upper or nasal extremity, and great pains should be taken to see that it fulfils its functions efficiently, for if there be any relaxation of the union here the lip will certainly be drawn upwards. The next one should be placed at the lower border, and the remaining one or two in the middle of the lip. Lastly, a sufficient number of threads of horsehair or fine silk can be used for the prolabium. The needle may with advantage be inserted from alternate sides. In this way the balance of the lips is more equally sustained, and the sutures should not be finally secured till all are in their proper places.—Plaster is frequently used after the operation, with the view of relieving any tension which may exist. It does so, certainly, but it soon gets damp and soiled from the milk with which the child is fed, and as a natural consequence the skin in its immediate proximity has a tendency to become excoriated.—An excellent way of *relieving the strain on the parts* is by means of a button suture, with a double thread of silver wire or gut, which can be drawn to the necessary tightness. The button of Macewen, from its admirable simplicity, answers all ends, and may be described to those who are not acquainted with it as a piece of tin, not unlike a halfpenny, but more oval in shape. In the centre of it are two holes, through which the threads are passed, and the desired amount of pressure can be regulated with the greatest evenness and nicety. These should be removed at the end of forty-eight hours. If retained in position beyond that time they are apt to leave a mark. The truss of Hainsby, provided it fitted accurately, would answer quite as well, and would be of benefit if worn for some time before operating.—Some surgeons are in the habit of keeping the patient under the influence of opium during the progress of healing, but, not having much experience of it, I cannot speak authoritatively

on the point. One thing is certain, the administration of such a drug to young children would require to be conducted with extreme caution.—In removing the stitches, it is an excellent plan to give chloroform. There is no struggling or crying under the influence of the anæsthetic, while if these are taking place it is sometimes no easy matter to accomplish the object we have in view.—When harelip is complicated with cleft palate, the cure of the former is a great adjuvant to the successful treatment of the latter, inasmuch as the steady compression of the united lips exercises a most beneficial effect in approximating the edges of the fissure towards one another. (Dr. James Whitson, Glasgow Royal Infirmary, Medical Times and Gazette, June 3, p. 578.)

HEMORRHOIDS.—*Carbolic Acid Injections*.—At a recent discussion at the New York Clinical Society, Dr. C. B. Kelsey referred to his experience with injections of carbolic acid. He uses a solution of one part of pure carbolic acid in six and a half parts each of water and glycerine, and of this he injects about five drops into each hemorrhoidal tumour. For the operation no anæsthetic is required, and the subsequent pain is said to be very slight. In one case in which he used a solution of double strength each pile sloughed, and in another case, treated by one of his colleagues, Dr. Kelsey saw extensive ulceration caused, but this he attributes to want of skill in the manipulation. He has usually repeated the injections at an interval of about a week, so as to see the full effect of each injection before making another, and in this way the treatment may extend over months, but as it is painless and does not necessitate rest or even the abandonment of ordinary work, this is not a serious objection to the plan in many cases. This method of treatment, when carefully carried out, appears then to be safe, efficient, nearly, if not quite, painless, and not requiring rest or special nursing. It may be useful, therefore, where for any reason the ligature or clamp operation cannot be performed, and especially where it is important not to lay the patient up during treatment. (Lancet, August 26, p. 321.)

Dr. Gill, in a monthly report of the Southern Illinois Penitentiary, says—"There have been more than a dozen cases of piles treated by carbolic acid injections. Many of these were of years' standing, and they now, even the worst, declare themselves entirely cured. The amount of acid injected was from five to ten minims, dependent upon the size of the tumour. The acid used was the crystallised, with just enough glycerine to hold it in solution. The operation was performed slowly, and the needle slowly withdrawn.

The course has been mild in most cases, and the results have been entirely satisfactory." (New York Medical Record, July 29.)

LUMBRICOIDES.—*Chloroform as an Anthelmintic.*—Dr. Semple cites cases in which the following mixture effected the rapid evacuation of lumbricoides. He regards it as a most certain anthelmintic:—℞. Chloroform, 3 j.; castor-oil, 3 j.; croton-oil, ℥j., mix well; dose from 3 ss. to 3 ss. (Practitioner, August, p. 140.)

TAPEWORM.—*Male Fern.*—The oleo-resin of male fern should be administered in conjunction with castor-oil. The object is to bring the extract, in an unaltered or undigested condition, in contact with the worm. The experiments which have been made by mixing one part of the oleo-resin with two parts of castor-oil have been very successful, and this mode of administration deserves, therefore, the preference. Oleo-resin of male fern is apt to derange the stomach, and when enveloped partly in the oil is likely to pass it more rapidly, which constitutes another advantage. The mixture, it is true, has an unpleasant taste. This may, however, be disguised by filling it in capsules of about 45 grains each. The dose may be regulated from six capsules (equal to 90 grains of the oleo-resin and 180 grains of castor-oil) to seven or eight more, according to circumstances. It is advisable to empty the bowels on the preceding day by a mild purgative, best by castor-oil. (Mr. E. Dieterich, New Remedies, July.)

AFFECTIONS OF THE URINARY SYSTEM.

ALBUMEN IN THE URINE. — **NEW TESTS FOR.** — *Hydrochloric Solution of Sodium Chloride.* — When albuminous urine is treated with a saturated solution of common salt, not the slightest reaction takes place; but if the brine be slightly acidulated with hydrochloric acid, the albumen is thrown down as a dense white cloud. This reaction constitutes a most delicate test for albumen in the urine. The best degree of acidulation for this purpose is obtained with about 5 per cent. of the dilute hydrochloric acid of the Pharmacopœia. A little more or a little less acid makes no appreciable difference in the sensitiveness of the test. Common salt dissolves in about two and a half times its weight of water at 60° F., and increase of temperature does not sensibly increase its solubility. The salt of commerce is always more or less dirty, and the solution requires filtration to fit it for use as a test. The salt solution should be fully saturated, otherwise the observer is apt to be led into error. In preparing the

test with our common English measures the readiest plan is to mix a fluid ounce of dilute hydrochloric acid with a pint of water, and to saturate this with common salt, and filter. Dilute hydrochloric acid may be replaced by dilute sulphuric, dilute nitric, or dilute phosphoric acid. All these acids are of the same saturating strength in the British Pharmacopœia, and all of them yield with saturated salt solution an equally sensitive reagent for albumen. Even acetic acid may be used, but the delicacy of the test in that case is not quite so great as when it is prepared with one of the mineral acids. The method of applying the brine test is similar to that followed with nitric acid. A portion of the suspected urine is placed in a test-tube, the test-tube is then held very much aslant, and the salt solution is allowed to trickle along the sides of the tube to the bottom, so that it may form a distinct layer below the urine. If albumen be present, a white cloudy zone appears at the junction of the two fluids. Or the proceeding may be reversed. The salt solution may be first introduced into the test-tube, and then the urine added with the same precautions as before, so as to obtain two distinct layers, one above the other, in the test-tube. It is important to be aware that the precipitation of albumen by acidulated brine is not due to a true coagulation. In this respect the brine test differs from nitric acid and boiling. In the two latter cases the albumen is transformed into the insoluble modification, which is known as "coagulated albumen." But when albumen is thrown down from urine by acidulated brine, the precipitate is not insoluble; on the contrary, it is redissolved by free addition of water, or even by free addition of the albuminous urine itself. It is therefore essential to the efficient application of the test that the salt solution should be in excess at the point of expected reaction. This end is obviously secured in the above-described methods of testing. (Dr. W. Roberts, p. 142).

Picric Acid Solution.—I have for some months used a saturated solution of picric acid as a test for albuminous urine, with results which may be briefly stated as follows: In normal urine it has never given a precipitate or produced any other change than the slight yellow tinge due to the colour of the solution, the mixture remaining quite transparent. When heat and nitric acid, applied with the usual well-known precautions, have shown the presence of albumen, the picric acid solution has invariably caused coagulation in proportion to the amount of albumen. Most clinical observers are agreed that one of the most delicate tests for a minute quantity of albumen consists in the addition of nitric acid to the cold urine, when a cloud appears at the junction of the two liquids. In apply-

ing this test the urine may be poured upon the acid which has been previously placed in the test tube, or the urine having been poured into the test tube, a few drops of the acid are allowed to flow down the side of the tube while held in a sloping position. It sometimes happens that when the amount of albumen is very small an interval of some minutes elapses before any change occurs at the junction of the two liquids. Now, in such cases I have found that a mixture of equal volumes of the urine and the picric acid solution has immediately become turbid with coagulated albumen. In this speedy and decided action of the test upon urine which is only slightly impregnated with albumen, the picric acid solution is superior to nitric acid. In applying this test it should be borne in mind that the picric acid saturated solution is but little heavier than distilled water, its specific gravity being about 1003; so that, unlike the heavy nitric acid, it tends when slowly poured into the tube to float on the surface of the urine, where a film of coagulated albumen forms at the junction of the two liquids. This floating film with the picric acid solution forms a pretty contrast with the film near the bottom of the test tube when nitric acid is the re-agent employed. The coagulum formed with the picric acid solution in cold urine requires a very large excess of water for its solution; in fact it is about as insoluble as the coagulum produced by nitric acid. The picric acid coagulum is readily soluble in caustic potash and ammonia; if, therefore, albuminous urine be alkaline it will require to be neutralised or acidulated before applying the picric acid test; but in all my numerous testings with the picric acid I have not once found it necessary to acidulate the urine. (Dr. George Johnson, *Lancet*, Nov. 4, p. 737.)

Metaphosphoric Acid.—Metaphosphoric acid, which is a solid glacial-looking body, is well known to chemists as a very delicate test for albumen, and I remember seeing, a few years back, its solution proposed for clinical use. Instead of the solution, however, a small fragment may be dropped into the urine to be examined. From very extensive trials extending over a couple of years, I can speak of it as an exceedingly sensitive re-agent and have sometimes found it give a decided indication where heat and nitric acid have failed to show any behaviour. Although an excellent test as far as sensitive behaviour goes, yet otherwise it does not possess all the properties that could be desired. The purer kind of glacial acid sold absorbs moisture from the air too freely to be convenient. There is a more impure form, which I am told contains some metaphosphate of soda, which is not so

deliquescent, and which may be broken into fragments, and thus kept for use. This, for between the last two and three years, I have carried in my urinary test-case as a companion to my cupric test-pellets for sugar (I observe Dr. Johnson refers to some Cooper and Fehling's test-pellets, and presume he alludes to the pellets which have been prepared at my instigation and under my directions, by Mr. Cooper, and which I brought to the notice of the profession about three years ago) and have entirely escaped from the inconvenience occasioned by a reagent like nitric acid. The metaphosphoric acid, however, although deliquescent, does not dissolve quickly, and the undissolved part of the fragment remaining after use is apt to cling to the interior of the tube in such a manner as to be quite troublesome to wash out. I have tried mixing the acid with pounded cane-sugar, chloride of sodium, sulphate of soda, and such like, but have not obtained what I could regard as a perfectly satisfactory product.

Yellow Prussiate of Potash and Acetic Acid.—Latterly I have looked in another direction, and have alighted upon something which has appeared to me to give promise of yielding what I have been seeking for. The combination of yellow prussiate of potash and acetic acid has been known of old as a good test for albumen, and I have frequently appealed to it when I have wanted the assistance of corroborative evidence. Now, citric acid may be made to take the place of acetic acid in liberating the ferrocyanic acid, which is the precipitant of the albumen. The combination yields a product which is devoid of any obnoxious properties, and possesses the essential quality of ready solubility in water. Probably it will be found that the best way of using it will be as a compressed pellet—the two substances being deprived of the water of crystallization that they will yield, and instead of being previously mixed, perhaps compressed, one on the top of the other. These, however, are details which are under consideration. I have tried the picric acid, which, as a test, answers to all that Dr. Johnson has said of it. One objection, however, belonging to it is its deep yellow staining property; and, also, its form as a solid agent is not a very satisfactory one to deal with. I have tried the picric acid, and the combination of yellow prussiate of potash and citric acid, against each other, and for delicacy the latter seems quite equal to the former. It remains to be ascertained whether it will serve in all cases of albuminous urine; but, on account of the acid present, it certainly serves in alkaline albuminous urine where Dr. Johnson suggests that picric acid alone might possibly fail. (Dr. F. W. Pavy, *Lancet*, Nov. 11, p. 823).

BORACIC ACID IN THE URINE.—*Detection of.*—From experiments carried out upon himself, M. Domergue finds that boric acid, taken internally in doses of 1-2 grm. a day, is eliminated in the urine within from twenty-four to thirty hours. The greater part is eliminated at the end of about twelve hours. The detection of boric acid in urine is effected by evaporating the urine to dryness, calcining the residue, and exhausting with sulphuric acid and alcohol. The alcohol flame will be bordered with green. The variations in the quantity of boric acid eliminated can be easily followed by dipping turmeric paper into the urine acidulated with hydrochloric acid, the depth of coloration of the turmeric being proportionate to the quantity of boric acid. (Dublin Journal, Dec., p. 530.)

DIABETES.—*Codeia.*—Dr. Brunton states that “diabetics bear large and sometimes enormous doses of opium and codeia; and, in administering these remedies, it is well to push the dose until the sugar either disappears from the urine, or until increasing drowsiness obliges us to discontinue it.” He also says: “The two remedies which are most serviceable in lessening the excitability of the nervous centres in diabetes are opium and its alkaloid, codeia. The latter may be given in doses of a quarter to half a grain three times a day at first.” Dr. Pavy has recorded a remarkable series of cases, in which daily records of the composition of the urine were made, and in which careful analysis of the urine showed that the sugar disappeared entirely under the influence of opium, morphia, or codeia, with the aid of restriction in diet. The drugs were given in gradually increasing doses: opium in doses of one grain up to nine grains thrice daily, morphia up to three grains, and codeia up to ten grains three times a day. The great advantage of codeia over opium and morphia was found to be that, whilst equally efficacious in controlling the disease, it does not exert the same narcotic effect. When given in a small dose to begin with, and increased gradually, nothing may be perceived beyond its effect upon the disease. Dr. Cavafy has subsequently reported a case in which he gave fifteen grains thrice daily with a good result. Dr. Ord has also reported the case of a woman aged 33, with diabetes of four months’ standing, who gained seven pounds in one week with one grain of sulphate of codeia twice a day, after diet alone had failed to produce any good effect. Although I cannot claim such satisfactory results as those given by Dr. Pavy, yet my cases now reported show that the drug employed has a remarkable power of checking the elimination of sugar, and that a corresponding improvement in the health of the patient results. It would appear that alkalies, and all other methods of treatment, are far inferior to the treat-

ment by codeia, which may be considered to have almost a specific action on the disease. The facts before us seem to justify decided language with regard to the use of codeia, which should not be permissive, but imperative, in all cases of advanced diabetes mellitus; whatever else may be given, codeia should first be given, and in fairly large doses, until some physiological effect is produced. Even dieting appears to sink into insignificance by the side of codeia; in one case given by Dr. Pavy, the codeia alone was sufficient, without any restriction of diet, the patient being on a mixed diet the whole time. (Dr. R. S. Smith, p. 139.)

HYDROCELE.—*New Method of Curing.*—This treatment consists in the introduction of a bougie into the sac after the latter has been punctured and evacuated in the usual manner. In the case of children or young persons the bougie (1-10th inch in diameter) is introduced to a depth of four or six inches, and remains in the sac from one to twelve hours. In adults the bougie may be passed in to a depth of twelve inches, and be retained for twenty-four or even thirty hours. When reaction has thus been ensured, the bougie is removed, and the inflammation treated by rest, compresses, &c., according to the degree of its severity. This new method has been tried in 250 cases. It is said never to have yet failed to cure, and that recurrence is rare. (Regazzoni, Edinburgh Medical Journal, May, p. 1051.)

SUGAR IN THE URINE.—*New and Very Delicate Test for.*—When equal volumes of liquor potassæ and a saturated solution of picric acid are mixed, there is usually a precipitate of picrate of potash; on boiling the mixture the precipitate is dissolved, and forms a transparent orange-red liquid. On adding a small quantity of saccharine urine to this liquid and continuing the application of heat the colour is rapidly deepened. The deepening of colour produced by the action of sugar is rendered more striking when the liquor potassæ is only slightly tinged yellow by a small amount of picric acid. It would seem that the effect of the picric acid is to intensify the reaction between the caustic potash and the sugar. Having obtained this result, I added to the boiling mixture of liquor potassæ and solution of picric acid a drop or two of diluted grape juice, with the same intense deepening of the colour. With a solution of cane sugar no change of colour occurred; but when the cane sugar had been converted into grape sugar by boiling with hydrochloric acid, the addition of a very few drops of the solution to the boiling mixture of liquor potassæ and picric acid solution caused immediately the same intense deepening of

the colour as occurred with the addition of the saccharine urine. As a result of these few but decisive experiments, I venture to say that by boiling this strongly alkaline solution of picrate of potash with a liquid suspected to be saccharine, we have a test for grape sugar far exceeding in delicacy the liquor potassæ test, or indeed any other known test for that substance. It appears that the effect of the picric acid is to increase to an extraordinary degree the delicacy of Moore's well-known test for glucose. (Dr. George Johnson, *Lancet*, Nov. 18, p. 870.)

URETHRAL SYRINGE.—*New Form.*—This syringe consists of an india-rubber body, from one end of which proceeds an india-rubber tube, terminated by a glass nozzle. The body is of an elliptical form with flattened sides. The two flattened sides of the body are each of them absolutely rigid, this rigidity being attained by the interposition of a thin but stiff iron plate in the substance of the rubber. The circumferential wall of the body which unites the two flattened sides to one another is wholly elastic, being composed only of rubber, and it has a slight outward bulge, so that when the rigid sides are compressed together, it yields, bulging outwards in all directions, and thus permits the rigid sides to be brought into complete contact with one another when compressed. The rubber of this circumferential wall is, however, sufficiently thick to be resilient, so that when pressure is released the syringe springs back accurately to its proper shape and capacity. In order to fulfil this requirement duly, I find that it is necessary that the circumferential rubber wall should be two millimetres in thickness. Now, when the rigid sides are pressed together so as to touch one another, and the nozzle dipped in water, then, on releasing the pressure, only a definite and constant quantity of water is immediately sucked up. Again, on gradually compressing the syringe till its flat sides touch one another again, this exact quantity is accurately expelled, but with it no air-bubbles. The capacity of the syringe is arranged so that this quantity is precisely that which is necessary to distend fully, but not unduly, the male urethra with fluid; and thus no injection passes into the bladder, the requisite quantity of liquid for the purpose being, as I find, one fluid drachm and a half. The nozzle is provided with an india-rubber cap, which takes off and on, so that the syringe, filled with a supply of solution, may be carried safely in the waistcoat pocket. (Mr. Balmanno Squire, p. 236.)

VARICOCELE.—The skin of the scrotum must be thoroughly cleansed with a five per cent. carbolic lotion, as also all instruments and the surgeon's hands, no spray being used.

The scrotum is then pinched up between finger and thumb in the usual way, so as to include the veins and exclude the vas deferens; it is then notched with a scalpel, and through the opening thus made a needle bearing a medium-sized twisted silk ligature (previously soaked for about an hour in the same carbolic solution) is to be passed. The veins are then allowed to slip backwards, and the needle made to carry the silk forwards again through the same puncture, but this time in front of the veins. The latter are thus, of course, included in the two loops of silk leaving the scrotum by the same aperture. The ends of these are now tied tightly over the veins about one-eighth of an inch apart. They are then cut short and allowed to slip into the scrotal tissues. Everything is in the meantime to be protected from any contamination by frequent wiping with a carbolised sponge, a little padding of salicylated wool being the only dressing. The results of this treatment in three cases are thus stated: There was a very trifling swelling around the seat of ligature for a few days, together with slight tenderness on pressure, otherwise nothing was complained of in the first two cases. In the third, considerable pain was felt for a day or two, and there was a little more swelling and tenderness. But in none of the three cases was there the slightest threatening of supuration. The first left the house in ten days, the second within a fortnight, the last on the fourteenth day. They were then walking about without any discomfort, except the third, who, having had a very large varicocele, still felt a good deal of dragging in the loin on returning to his work, which was very hard, and some neuralgic pain. These, however, passed off later, under the use of laxatives for obstinate constipation from which he suffered, though he continued to work for long hours as a grocer's assistant. I watched all these three cases for several months, the last until quite recently, about a year after operation, and now regard all danger of the ligatures coming away as quite over. The latter could be felt under the finger as small knots deep in the scrotal tissues, which appeared quite normal. Whether they will ever come away remains to be seen, but this is immaterial, as far as the patient is concerned, for they give no trouble now. (Mr. Arthur E. Barker, p. 239.)

I have for some time adopted a mode of ligature for varicocele which has been found to answer very well. It is a modification of M. Ricord's plan. The skin of the scrotum, with the veins being pinched up in the usual way, a needle armed with silk is passed beneath the vein, puncturing the skin at the opposite side, and the needle withdrawn, leaving

a loop of silk projecting. A second needle is now passed in the opposite direction between the veins and the skin, leaving a loop also. The free ends of the ligature are then passed one under and one over each loop, drawn up tight, tied, and cut off short, the knot on each side sinking subcutaneously. The after results are the same as in the cases described by Mr. A. Barker. The performance of it is quick, simple and efficient. (Mr. W. D. Spanton, *Lancet*, Oct. 21, p. 684.)

Free Excision of Redundant Scrotum.—Dr. Henry, of New York, has revived the method suggested by Sir Astley Cooper of treating varicocele by free excision of the redundant scrotum. He says, “The instrument which I have called scrotal forceps, or clamps, consists of two parts. The main part of the instrument has two double-curved blades, made of steel, about ten inches long, sufficiently heavy to give strength and admit of pressure without injury when in contact with the tissues. The handles are large enough to admit of a good grasp without cramping. That part of the instrument below the joint is curved as nearly as possible according to the natural lines of the raphæ, from the upper anterior part of the scrotum down to and under the scrotum, so that it embraces, when placed in front of the scrotum, the entire and exact portion which it is desired to remove. The co-acting surfaces are evenly notched to prevent the tissues from slipping, affording a more secure hold on the soft parts, with less pressure and less injury than smooth surfaces. The blades are only thick enough to give strength, without leaving too much tissue in front. The handles are curved, so that, while they maintain a direct median line, they do not interfere or press on the genital parts. The double spring, besides giving additional security and compactness, renders them, to a great extent, self-acting, easy of manipulation, and that, at times of very great consequence, ability on the part of the operator to perform the operation without the aid of additional assistance. The screws in the handle and at the ends of the blades afford a complete and perfect hold of the parts to be removed. They are not adjusted until the operator is perfectly satisfied that he has embraced the exact portion to be removed in front of the blades. The extra blade is made of steel, nickel-plated, and is maintained in the right anterior surface of the clamp by two small pins that fit in grooves cut in the clamp. It is easily inserted with a little pressure, and removed as easily by pressing downward and forward; it is then dislodged by slightly raising the extreme end. The extra blade, when in position, leaves a fenestra to afford the surgeon the facility of inserting all his ligatures,

should he prefer it, before dividing the parts. The thickness or amount of the tissue left in front of the main blade and between that and the extra blade, which is the guide for the part to be removed, is ample to assist union, and if the division is a clean one, and the stitches are close and evenly inserted, the pressure and tension are so slight, or rather, divided over the entire cut surfaces, that there is little probability of ulceration through the stitches before union has taken place. When the part has been removed the extra blade is displaced, leaving a free border exposed in front of the main blade about a quarter of an inch in thickness. In a few minutes the whole wound can be stitched without any inconvenience. The clamp is of course, not removed until this is accomplished. Besides the clamp, the only instruments necessary are the scissors or scalpel, needles, with either silk or fine silver wire for sutures, a few acupressure needles, a few *serres-fines*, silver pins, and some adhesive plaster." (Dr. M. H. Henry, Dublin Journal of Medical Science, March, p. 218.)

VESICAL CATARRH.—*Boracic Acid*.—Prof. Rosenthal, of Vienna, has derived decided benefit from boracic acid in various forms of catarrh of the bladder. R. Boracic acid, pure, 1 part; warm water, 20 parts; hot glycerine, 5 parts. M. This mixture will keep well for months, and may be given in teaspoonful doses once or oftener daily in a glass of water. (Dublin Journal of Medical Science, Dec., p. 530.)

AMPUTATIONS, FRACTURES, DISLOCATIONS, AND DISEASES OF BONES, JOINTS, ETC.

CIRCULAR AMPUTATION.—*The 'Coat Sleeve' Method*.—I would impress on you not only the importance of making a far greater allowance for retraction of skin in planning an amputation, but also the comparative uselessness of any other structure than skin for making an efficient and lasting pad for the end of the bone. It is the skin, fat, and hypertrophied sub-structure that give a good cushion. Having dissected your skin-sleeve accurately, and divided all the structures down to the periosteum, carefully peel this membrane upwards to the point at which the saw is to be applied, and shelter the soft structures from the stroke of the saw by means of a slit bandage, retracted by an assistant; and, within reasonable limits, the smaller the saw is, the easier is the division of bone effected. Next, trim your stump (*i.e.*, cut off with scissors any projecting tendon or nerve), and tie or twist the bleeding vessels. Then tie up the skin-sleeve (3) with a piece of tape (1) passed through a cylinder, as

shown in the *diagram* (p. 146); allowing the ligatures (if any) to hang through the crucial slit at the face of the stump. Treat your wound either with or without dressings—I much prefer none; and carefully watch that no undue strangulation of the “off-end” (2) of the skin-sleeve occurs. Should the stump become œdematous, or any necessity for drainage arise, insert a drainage-tube into the centre of the face of the stump, of sufficient firmness to prevent a too ready collapse of its walls (*e.g.*, a piece of gum-elastic catheter), and allow the excretion to flow into a pledget of marine tow or some absorbent material. As yet, I have not had occasion to resort to any artificial drainage. The wound cicatrises up to one-half or one-fourth of an inch; and a central button of depressed scar-tissue results, surrounded by soft, fatty skin-cushions, plaited in a radiating manner from the centre to the circumference of the face of the stump. This method of amputation is applicable to any part of the extremities, in those cases where the surgeon has the opportunity of selecting the precise point of removal, and where the adjoining skin is sound. In my own experience, the middle of the leg, where the muscles of the calf swell, is about as difficult a situation as any for carrying out the dissection of a long sleeve. (Mr. Richard Davy, p. 145.)

DISLOCATIONS OF THE HUMERUS.—*New Method of Reducing.*—

For my operation, the selection of a couch or bed is of importance. It should be firmly fixed, and hard, and, when a choice is practicable, I prefer it, for the subglenoid dislocation, to be about three inches lower than the great trochanter of the operator, whilst one lower still by a few inches, for the anterior dislocations, and a little higher for the posterior, allows the force to be applied advantageously in the direction of the glenoid cavity. The patient should be placed as close as possible to the edge of the couch, on his back, with his head low. In order to make the description of the procedure intelligible, I shall divide the operation into two stages. The first, or preparatory stage, in which the surgeon assumes the most favourable position for the reduction, is well depicted in Fig 1 (p. 149). The operator places the injured arm at right angles to the body, and standing against it, with his side to the patient and his hip pressed firmly, but not roughly, into the axilla, he folds the arm and hand of the patient closely round his pelvis, and fixes the hand firmly by pressing it against the crest of his ilium. The second stage, during which the reduction is effected, is very simple, consisting merely of a rotation, or version, of the

surgeon's body into the position represented in Fig 2 (p. 150), with a force and rapidity which necessarily vary with the peculiarity of the dislocation—some yielding most readily to a sudden and powerful effort, and others to gentle and gradually increasing traction. (Mr. James E. Kelly, p. 148.)

The number of modes of reducing dislocations of the shoulder shows that the best plan is yet generally unknown. A valuable paper on this subject was read by M. Kocher at the International Congress in London. Referring only to the subcoracoid form of dislocation, he asserts that the aim of the surgeon should be to open out the rent in the capsule, and to relax the parts of the capsule which are untorn but tightly stretched by the false position of the head of the humerus. The rent in the capsule is on the inner side of it; the most tense part is the upper portion where it is thickened by the coraco-humeral band; the lower part of the capsule is also tense. Kocher asserts that by rotating the arm outwards the top of the capsule is itself rotated out and the rent rendered patent. If now the arm be advanced in the vertical median plane, the upper part of the capsule is relaxed, and the head of the bone, being prevented passing forwards by the lower fibres of the capsule, enters the glenoid fossa. He accordingly directs that for the reduction of this dislocation the following manipulation should be practised. The patient should be seated, with the surgeon on his left hand. The elbow-joint is first to be flexed to a right angle, and the joint firmly pressed against the side of the chest; then while holding the elbow in contact with the body the arm is to be slowly, gently, and steadily rotated out until firm resistance is encountered; then maintaining this rotation the arm is to be raised forwards and a little in, and lastly to be rotated in and the hand brought towards the opposite shoulder. It is stated that there is no need for anæsthetics when this manipulation is employed. This method, which has great advantages over those in common use in this country, is stated by M. Ceppi to be especially valuable in old dislocations, enabling them to be reduced often without any force and without anæsthetics. M. Kocher has succeeded in twelve cases of dislocations, varying from three weeks to four months old. In one case, where the bone had been displaced for eight weeks, he fractured the shaft of the humerus in attempting the reduction, and six weeks later, when the bone was united, failed again. This patient was seventy years of age. We believe that this method of reduction is worthy of far more attention than it has yet received. (Lancet, Nov. 4, p. 773.)

DISLOCATIONS OF THE FEMUR.—*Two New Methods of Reducing.*

—Three strong “screw hooks” are inserted into the floor close to the perineum and each ilium of the patient, and to those hooks he is secured by a strong bandage or rope. The injured thigh is flexed at right angles to the patient’s body; the foot and lower extremity of the tibia are placed against the perineum of the surgeon, who, bending forward with his knees slightly flexed, passes his forearms behind the patient’s knee, and grasps his own elbows. He is now in the best position (Fig. 1, p. 153) to accomplish the reduction. With this object he exerts his strength to draw the femur upwards, which action is generally sufficient to effect it; but, when necessary, circumduction may be combined with extension, as the surgeon, while maintaining traction sways his body towards the patient’s uninjured side, then towards his head, then outwards, and stepping backwards, he lays with a sweep the injured limb by its fellow, and thus the dislocation is reduced. In ischiatic dislocations a bandage, upon which an assistant may make traction, can be passed round the thigh close to the trochanter, and may be useful for the purpose of liberating the head of the bone from the sacro-sciatic foramen. Contrast the facilities afforded by this and by the other methods of reduction for making extension, counter-extension, and coaptation. In femoral dislocations the application of extension is more difficult than in humeral luxations, owing to the dimensions of the limb, which render the grasp of the surgeon almost useless; while the clove hitch and other appliances are notably insecure when placed above the knee, over which they slip with great facility. When the traction is applied to the ankle much of the power is lost, owing to the length of the intervening limb, and the great advantage derivable from the application of the leg as a lever to rotate the femur is forfeited. In my method the extension is applied in the most approved direction, and with the greatest economy of force, as the muscles of prehension are hardly called into play, being only required for the slight effort necessary to fix the hands on the elbows, while the forearms are flexed by their numerous and powerful muscles, and the patient’s leg is kept in position by being a lever of the third order, and its displacement, owing to the unfavourable point to which the power is applied, would require a force of over a thousand pounds.

For *anterior luxations* I propose the following method, which is a modification of that suggested for humeral luxations:—The patient is placed on his back on a bed or table of such an elevation that his pelvis is nearly as high as the trochanter of the surgeon. A bandage passed round the

pelvis, and secured on the side of table or bed furthest from the dislocation, affords efficient counter-extension. The surgeon, with his face directed towards the dislocated joint, stands on the inner side of the injured limb, with his trochanter pressed firmly against the femur; bending the leg behind his back he grasps the ankle with the corresponding hand, and is in the position (Fig. 2, p. 155) to effect the reduction. He now rotates or turns his body away from the patient, thus making traction on the femur in the most favourable direction, and, at the same time, pressing its head towards the acetabulum. I have already considered the mechanism of this expedient in my former paper. The operator has one hand disengaged for the application of minor manipulation if it should be necessary. (Mr. James E. Kelly, p. 152.)

DRAINAGE OF DEEP WOUNDS.—India-Rubber Threads.—At a meeting of the Philadelphia Academy of Surgery, Dr. Levis presented a new material for the drainage of deep wounds. He referred to the disadvantages of the india-rubber tubes as generally used for this purpose, and stated that they soon became occluded by viscid matters. Their pervious condition is soon lost, and their contents become septic and sources of danger. The material that he uses exclusively is simply threads of india-rubber such as are used in weaving elastic textures. Their softness and pliability render them mechanically unirritating. Any number may be introduced, varying with the extent of the suppurating cavity; and, if desired, they can be removed singly: thus gradually decreasing the drainage. The material is inexpensive, and may be obtained from any dealer in india-rubber goods. (Med. Times and Gazette, May 27, p. 569.)

EUCALYPTUS-VAPOUR AS A SUBSTITUTE FOR CARBOLIC SPRAY.—In the vapour of eucalyptus, cajuput, and other volatile fluids, we have powerful antiseptics, which at the ordinary temperature of the atmosphere, may so saturate the air as to kill all infective particles; perhaps not only bacteria and micrococci, but also the germs of fevers and other infectious diseases. I have experimented with terebene with good results; but, as eucalyptol is abundant, cheap, and not unpleasant, it was selected for further tests. In my microscope room, which is an attic at the top of the house, and in which there are numerous organic particles, rendering the air anything but pure, I exposed flasks, prepared as related, to the vapour of eucalyptol, by scattering it on the floor, half an hour before removing the plugs of cotton from the sterilised vessels. The hay-infusions, exposed for periods varying

from one to twenty-four hours to this atmosphere, for the most part remained free from germs, after being placed in the incubator; but, as the results were not always the same, I cannot vouch for this method being reliable to sufficiently purify the air for an antiseptic operation. Hence I was led to devise a machine in which the air is first passed through a cylinder containing cotton-wool, which Pasteur has proved to be sufficient to free it from germs; but, as this would only be a pure, and not an antiseptic air, it is then passed through two cylinders containing pumice-stone, over which about an ounce of eucalyptol has been poured. Thus it emerges as a pure air, loaded with invisible particles of an antiseptic, which seems to be capable of destroying any vestiges of germ-life which may have been drawn in from the surrounding atmosphere: it is directed over the desired spot by means of five coralline nozzles, which act on a ball and socket-joint, capable of being fixed in a certain direction by a screw. The bellows were obtained from Mr. Fletcher of Warrington, and give a continuous current at a considerable pressure. Messrs. Meyer and Meltzer make the entire machine. Several cases are given in which the eucalyptus air has been employed. (Mr. A. W. Mayo Robson, p. 175.)

FRESH WOUNDS.—A wound cannot heal quickly unless the contact of its surfaces be reasonably close. The more accurately the edges are approximated, the more certain are they thus to heal. This accurate apposition can only be brought about by sutures. To attain, then, the object which we have in view it is first of all necessary to have sutures which can be absorbed by the tissues, and we find our wants to a great extent met by carbolised catgut. But the chief difficulty in the use of sutures undoubtedly lies in the tension to which they subject the textures. If the tissues are perfectly lax, and union by the first intention take place, the new material which unites them is sufficiently strong in three or four days to resist the normal elasticity of the cutaneous envelope. In such cases a fine catgut would last for the necessary time. But inasmuch as, from exudations of blood or serum, or from other circumstances, either the union may be somewhat delayed or the tension somewhat greater, it is well that the catgut be of such a quality and thickness as to secure it from absorption for seven or eight days. More than that is unnecessary. It is a mistake to suppose that the use of a permanent material as wire, silk, or horse-hair, enables you to resist tension. The fact is that if a wound be perfectly lax, sutures are of use only in maintaining steadiness, while on the other hand, if the tension is such that the wound

requires support against it after the first week, any ordinary suture which may have been left in will have cut its way through the skin, and, so far from doing good, will add to what inflammatory action may be present. There are cases in which, from deficiency of skin or from other causes, we must be prepared to encounter much tension; and under healthy and aseptic conditions we may attain union of any surface which we can bring into apposition by manual pressure, which can be so maintained without cutting off its blood supply. But in such circumstances we must distribute the pressure and take it off the margin of the wound by buttons or quills, being careful so to apply them as to get the maximum of relaxation at the edge with the minimum of pressure on any one point. It is not in virtue of the permanent nature of the material, but because of the distribution of pressure, that we meet with our success. Even thus tension is not entirely evaded. These sutures are not without their disadvantages. The material which unites the buttons tends, of course, to pass from one to the other by the shortest route, and in doing so produces ulceration, which is none the less real because it is not always visible on the surface. In septic wounds it is frequent, and in aseptic it occurs that suppuration forms in the track of such sutures, and, if it do so, is apt to be dammed back by the button. They ought, therefore, to be taken out as soon as possible. Of them, also, it may be said that in most cases they have fulfilled their mission in ten days; and unless the tension be very great indeed, and the union very sluggish, I find they may be safely removed in that time. Plainly, then, catgut, especially if chromicised, may be used to unite the buttons instead of silver wire. When it is absorbed the buttons will lie harmlessly under the dressings, in simple contact with the skin. (Mr. John Duncan, p. 179.)

HEY'S INTERNAL DERANGEMENT OF THE KNEE-JOINT.—My explanation of the nature of Hey's internal derangement of the knee-joint is that, by the combined twisting and lateral movement conveyed to the knee at a moment when the ligaments are as lax as possible, the margin of the condyle is *jerked over* the edge of the internal semilunar fibro-cartilage. The immediate result is pressure of this structure, which is increased when the resulting pain brings about spasmodic contraction of the surrounding muscles. The leg undergoes in these injuries a rotatory movement which carries the tibia forwards and outwards. A similar rotation of the leg in the opposite direction, and an analogous displacement of the outer condyle occurs, I have no doubt, in the case of the

rarer variety of 'derangement' which is located in the outer part of the joint. The comparative infrequency of this latter is, I think, satisfactorily explained by the greater mobility of the outer cartilage, and the existence of a strong femoral attachment, which secures its adaptation to the varying positions of the outer condyle. (Mr. J. F. Knott, p. 163.)

Displacement of the Semilunar Fibro-Cartilages of the Knee-joint.—My experience of these cases is in accordance with the opinion expressed by Mr. Hey in his original observations; for in all the cases which I have observed, the symptoms appear to indicate a displacement of one of the cartilages forward. I consider that in all these cases an unnatural laxity or weakness of the ligaments of the joint predispose to the accident. (Mr. E. Noble Smith, p. 164.)

LAMINATED PLASTER SPLINTS.—Take a few sheets of muslin, put them one over another, spread plaster-of-Paris between them, roll or fold up this 'layered' sheet in any convenient form, dip it in water a few moments, lift it out of the water and very gently squeeze it, spread it out neatly and smoothly, and you have a soft sheet of splintage ready for any purpose which splints can secure. The sheet may be little or big; it may envelope a finger or a limb, or the trunk, or the trunk and the head, or the trunk and the lower limb. It is simply drawn under the part, and folded over it. The drawing under, the folding over, and the trimming by means of scissors, are the work of a time measured by seconds. The part is kept in one unaltered position by intelligent force until the sheet sets—a time measured by minutes. A firm, durable, and perfectly fitting splint is thus obtained, which may be left on for weeks or months. The principle of lamination or stratification in the construction of plastic splintage may, with suitable change of detail, be extended to other materials; but I have hitherto found the checked muslin and thinly spread plaster in superimposed layers the most generally useful—useful in fractures, joint-diseases, spinal diseases; useful, in short, wherever rest, immobility, and support are needed. The laminated plaster splint is quickly and easily made. The surgeon first determines how much of the limb or trunk it is well to cover. A pattern is then cut. One of the layers of checked muslin does very well for this purpose, as it is stiff enough to keep its shape, and is easily marked with a pencil. Afterwards, other pieces of muslin are cut of the same size and shape. Six or seven layers make a good average splint; three or four will do for a child; eight or nine may be needed for a heavy, restless, or delirious patient. The first layer is laid flat on the table,

and sprinkled with a stratum of good dry powdered plaster, which is smoothed over with a spatula or paper-knife; on this, with its margins corresponding, is placed the next layer of muslin, which in its turn is sprinkled with plaster. The process is repeated until all the layers are in place. The splint is then slowly and carefully folded or rolled up and kept dry, ready to be dipped in water when wanted. The water—let this be well understood—immediately passes through any number of layers of muslin and plaster, thoroughly drenching them both in less than sixty seconds. The part to be encased is drawn into position, and held so until the plaster partially sets. If the fingers of the extending hand be in the way, as when the foot is included in the splint, a temporary sling of webbing or plaster over the instep and heel may be used, which can be drawn out or relaxed afterwards. A flannel bandage, or layer of wadding or jersey, is next applied without traction. The splint is now dipped in hot water (hot for comfort and for more rapid setting) for a minute or so. When taken out, it is very gently squeezed, being still quite sloppy and limp. When the water is pressed out too freely, the sheet will be sandy, friable, and difficult to apply. The splint is then unfolded, and drawn out in a perfectly soft and smooth sheet; it is next put under the ailing part, and simply folded over. The overlapping margins instantly and firmly adhere to each other. Traction should be most carefully avoided; perfect neatness is enough. The layered plaster splint is applied with as much ease, as regards limpness and adjustability, as is a fomentation; but it is a fomentation which sets, and, with rock-like firmness, lastingly holds the part in any given position.—In the upper limb, the laminated sheet should be large enough to overlap two or three inches; in the lower limb, the overlapping should extend to three or four inches; in the trunk, to five or six. A pair of strong sharp scissors easily trims the splint while it is still wet. Redundance may be now curtailed, or windows made. To get a neat fit opposite joints, especially flexed joints, as the elbow and ankle, the margins of the splint may be notched at each side, or V-shaped bits may be cut out. The corners of a paper box suggest methods of dealing with the elbow. Windows may also be made, and redundancies curtailed very readily, by means of a sharp scalpel, when the plaster is partially set. When the splint is quite dry, a Hey's saw may be used. When it is wished that a sixth or fourth of a whole limb shall be visible, a longitudinal strip is easily removed with a knife in the early setting stage—a stage which lasts long enough for any desired degree of carving. Windows, scollops, or openings of any kind, do

not weaken a splint; and it is better to make them opposite bony prominences, breasts, and other compressed parts, as well as opposite abscesses, wounds, and compound fractures. If it be desired, a sheet-splint may be put on at first, so as to leave a longitudinal strip uncovered. If so, a separate outer layer of muslin must be large enough to overlap, and be fixed with a row of pins for a few minutes. I have adopted this method several times; but I much prefer the overlapping method for ease of application and for efficiency. If, in rare cases, an exposed strip be desired, the carving method in the setting stage is preferable. In the upper limb, a gaping longitudinal splint may be conveniently held in place by a few turns of bandage until the setting is firm. (Mr. Furneau Jordan, p. 168.)

RIDER'S SPRAIN.—*Huxley's Support for.*—This apparatus consists of a firm band fitted with a pad impinging on the usual seat of injury. The band is firmly buckled so as to secure pressure on the very highest part of the thigh. The holding it securely in this position has been the great difficulty, but this is effectually accomplished by Mr. Huxley's arrangement of support by a pelvic band, which renders the important thigh arrangement absolutely immovable. The drawback to the figure-of-8 contrivance, recommended by many surgeons, is that it is necessarily relaxed when in the riding position, and cannot secure the direct support realised in all positions by this band. (Lancet, Aug. 26, p. 315.)

SURGICAL NEEDLE FOR WIRE SUTURES.—*Dr. W. P. Morgan's.*—This is a slight modification of the needle in common use in this country for wire sutures. Instead of a solid "eye," this end of the needle is tubular, the tube opening one-eighth of an inch from the end in a slit one-eighth of an inch long. The wire is passed along the tube and out at the slit. Its



end is then doubled on itself, and the loop so made drawn into the slit. If this be done neatly, the wire does not make any projection on the needle, and the suture can be passed with a minimum of friction and force. At the same time, however, we must add that the needle is not threaded so quickly and easily as the gutter-eyed needle. Dr. Morgan's suture needle is made by Messrs. Arnold & Sons, 35 and 36, West Smithfield, E.C. (Lancet, July 8, p. 12.)

TENOTOMY.—*Continuous Extension after.*—For obtaining permanent good results after division of tendons, not only is it necessary that the distorted limb be placed in its rightful position by the division of parts, whether tendon or fascia, that hinder by abnormal contraction the extension of the foot, but far more important is the maintenance of the limb by continuous extension in that exact position which it is intended ultimately to assume. By forcible manipulation under chloroform many of the fibrous bands and interosseal ligaments which had helped to keep the limb in a wrong position can be stretched or divided, and the astragalus brought up to its normal position under the articulating surface of the tibia. I find that the tendo-Achillis requires division in the great majority of varus deformities simply because the gastrocnemius pulls the foot inwards as well as backwards during the flexion of the foot. The broad insertion of the tendon into the os calcis and the solid sheath encasing it permits of free division without absolute separation of all the attachments. By careful bandaging of the foot and leg the leverage obtained by the extensor muscles is to a great extent restored. As soon as all muscular impediment to the rectification of the foot is removed, there remains a considerable amount of distortion from the paralysed state of the extensor muscles. To obviate this I carefully apply a plaster-of-Paris bandage over a flannel 'protective,' bringing the foot up into its proper position by very firm manipulation, and keeping up this extension until the bandage has 'set.' (Mr. Frederick Churchill, p. 173.)

WOUND DRESSING.—*Boro-Glyceride.*—Carbolic acid is a topical and general poison. The local irritation is such that the wound has to be guaranteed against its continued contact by a material termed protective; and even then, pretty severe irritation, causing excessive wound-secretion, is the rule rather than the exception; and, when the cancellous bone-structure of young subjects is laid bare, as in excisions, a local osteomyelitis is very apt to be produced. The absorption of carbolic acid by the wound has been deadly, but has more frequently been not quite fatal. Impressed by the records of carbolic poisoning, I have for some time past been endeavouring to find a reliable safe antiseptic. Thymol, in my hands, entirely failed, nor has the eucalyptus answered my expectations. Boracic acid seemed to me the most reliable substance. I found it, however, very unmanageable, and was actually engaged in trying to overcome certain difficulties, when, on April 1st, 1882, Prof. Barff's lecture on the preservative qualities of boro-glyceride appeared. Mr.

Barff courteously at once complied with my request for a sample; and, after a few experiments, I began its use on the human subject. It is a soft solid, softer now than in colder weather; but by placing the bottle for a while in very hot water, the material comes to be of the consistence of treacle. I do not conceive that the solution of boracic acid in glycerine—for this is merely a saturated solution in the hot fluid—confers upon the former any new quality; it merely renders it more manageable, especially more soluble in water, and more miscible with other substances. The mode in which I generally use it is as follows: For economy's sake, I generally cleanse my hands and instruments, also the patient's skin, with carbolic acid. I then operate in the open, without any spray or further precaution. The operation completed, the wound is thoroughly mopped and sponged with a 5 per cent. solution of boro-glyceride in water (that is, one ounce to a pint); or, in case of a cup-shaped wound, I fill it with the solution. After this the wound is stitched and covered with eight or ten layers of lint, and, where necessary, as in amputations, also with a light bandage similarly soaked. The whole is then enveloped in thin mackintosh; if no oozing takes place, there is no need for dressing again for three or four days, sometimes for more. When the dressing is removed, all parts of the wound where the lips have been adjusted are found united or uniting, according to the time elapsed, the surrounding skin being entirely free from redness or any sign of irritation; it is, on the contrary, soft and white like that of a baby. With respect to drainage, whether it be desirable or not, my cases have not enabled me to decide that point with absolute certainty. In two cases in which I omitted that appliance, one had for two days a temperature of 99.5° to 99.8° ; one for three days a temperature of 100.2° to 101.0° , a mere traumatic, not a septic, temperature, since it began at once, and ended in from forty-eight to seventy-two hours. Others, notably a breast case, with glands extracted from the axilla, making a deep hollow, had no fever at all. Let me also call attention to the use of this material for injection into the bladder in *cystitis*. When the mucus and urine are inclined to decompose and become ammoniacal, this compound acts like a charm. I have found it invaluable if any irritation arise after litholapaxy. (Mr. Richard Barwell, p. 196.)

The boro-glyceride described by Prof. Barff is patented in this country and on the Continent. It can be obtained from Burgoyne, Burbidges, & Co., chemists, Coleman Street, E.C.; Hopkin & Williams, Cross Street, Hatton Garden; or of G. Bower, Esq., St. Neots, Hunts. (Lancet, May 13, p. 809.)

In appearance boro-glyceride is like large cakes of isinglass, of the colour of gum acacia, sticky as toffy, and has a slightly warm taste of indefinite and transient character. In solution it is colourless and almost tasteless. A case of Syme's amputation for ankle-joint disease was treated with boro-glyceride from the first—*i.e.*, the flaps were washed with the solution, and the stump wrapped in lint steeped in 1 to 40 solution; the subsequent dressing consisted in washing out the cavity and using lint as before, the result being as excellent as, but not more excellent, than I have seen in similar cases treated with dry lint. The stump kept sweet to the nose, but the drainage-tube and pus squeezed from the stump were not so. Boro-glyceride is innocuous, a matter of great moment, when one recollects how many patients have been poisoned by doses of carbolic acid by inadvertence, how many untoward symptoms have been put down to the use of the carbolic spray and absorption of carbolic acid. (Dr. Henry A. Lediard, *Lancet*, Nov. 18, p. 841.)

Boracic Glycerine.—Mr. Balmanno Squire suggests that boracic glycerine can be made to take the place of carbolic acid in all the operations of antiseptic surgery. That it can be so used in certain cases and with advantage I feel sure; *e.g.*, when a wound, treated antiseptically with carbolic acid dressings in any one of the usual methods, has become almost superficial, and begins to respond too vigorously to the irritation of even weak carbolic oil, it will heal more readily and kindly under lint moistened with ordinary 'glycerine of borax,' than if treated with simple water-dressing, or with dry lint. This may be proved by simultaneously treating two similar wounds on the same limb, or two different portions of a large superficial wound, by the two methods, and noting the rate of progress and the result in each case. Ulcerated superficial wounds, once they have been cleaned and stimulated into healthy action, usually heal very readily under this treatment. But, in deep, or lacerated, or contused wounds—those from which we would expect, under ordinary circumstances, a good deal of suppuration—the boracic glycerine has disappointed me, and has seemed much inferior in usefulness to carbolic acid; and I think that the powerfully hygroscopic qualities of glycerine which come usefully into play when the main business in hand is the formation and protection of young epithelium, are, at best, of doubtful value in lesions involving greater depths of tissue. On the other hand, in dealing with weak, pale, and flabby granulations, boracic acid lacks that quality of sufficient irritating power which, when responded to, we term stimulation. It

apprehend that the chief value of glycerine as a vehicle of the germicide boracic acid lies in the fact of its being in itself aseptic, protective, and hygroscopic, and not subject to evaporation at ordinary temperatures. I have often found boracic glycerine a pleasant and successful application in in cases of *tinea circinata* and of *pityriasis versicolor*. (Mr. C. E. Shelly, p. 199.)

Glyceroborate of Calcium and Glyceroborate of Sodium.—M. Le Bon has just presented to the Academy of Sciences two new and very effective antiseptics, the glyceroborate of calcium and the glyceroborate of sodium. Both of these compounds have the advantage of being very soluble, destitute of odour, and free from all toxic action. When exposed to the air they both deliquesce with great rapidity, absorbing from the air an equivalent weight of moisture. Both alcohol and water dissolve twice their own weight of these salts. They are powerful antiseptic agents even in very dilute solution; the most effective in a therapeutic point of view appears to be the calcic salt. It is absolutely innocuous, and it can be applied in strong solution to so delicate an organ as the eye without bad results. In a hygienic sense both can be employed with advantage as disinfectants and as preservers of meat and other alimentary products. M. le Bon has transmitted meat simply coated with a varnish of the glyceroborate to La Plata, and it has arrived in a perfectly fresh and sound condition. He thinks both salts will prove very useful as antiseptics in Lister's mode of dressing wounds. (M. G. Le Bon, *Lancet*, Aug. 5, p. 195.)

Turf Mould as an Antiseptic Dressing.—Dr. Neuber has investigated the antiseptic qualities of turf-mould. These qualities were already recognised in other quarters. It was found that the turf, which is of a remarkably fibrous and friable character, acted as a powerful deodoriser of fæcal and other like offensive substances. A company has been started for the purpose of popularising the new material, under the name of 'moss-litter,' as a bedding for horses; and the mould has been used in the latrines of infantry barracks in Brunswick. We recently inspected a large range of new stabling erected by a railway company, in which the 'moss-litter' was extensively used, and was found to act so effectually as a deodoriser, that the same bed could be used for two or three months. Dr. Neuber found that the dust or fine powder arising in the preparation of the moss-litter for the market also possessed a powerful affinity for ammonia, carbonate of ammonia, and other products of decomposition. A series of experiments in the use of the mould as a surgical

dressings were made, and the experience gained may be thus summed up. The turf-mould, reduced, as we gather, to a powder, is enclosed in gauze bags which have been thoroughly washed in carbolic acid solution. The bags are made of two sizes, and the mould in the smaller is mixed with iodoform in the proportion of 2·5 per cent.; the mould in the larger bag is saturated with a solution of carbolic acid (5 per cent.). In applying the dressing, the wound is first washed with carbolic or with chloride of zinc lotion, or powdered with a little iodoform. The small bag is then placed over the wound; over that a large bag is adjusted; and both are retained in place, and an equable pressure kept up, by a gauze bandage. The dressing was used by Prof. Esmarch in fifty-five cases, among which were included seven resections and osteotomies, five amputations, twelve extirpations of tumours, and two herniotomies. The results were most satisfactory. (Editor of British Med. Journal, p. 201.)

Dry and Infrequent Wound Dressing.—The communications on Puff-ball (p. 216) and on Salicylic Silk for Wound Dressing, suggest a few observations on the principles underlying the treatment. Those materials have the common character of being dry and absorbent, and, in the case of the salicylic silk, it is especially noticed that the dressing was renewed infrequently, sometimes not until the twelfth or fifteenth day. The discussion on wound treatment has brought more and more into prominence the value of infrequent dressing, on which the majority of surgeons are now agreed. Dry dressing is also gaining largely in favour. The value of rest is universally conceded, and of position rarely questioned. Pressure is also, though more slowly, winning the place it merits in surgical therapeutics; and I venture to think the time is not far distant, when general assent will be given to the proposition which I have repeatedly had the privilege of sustaining in these columns: "The majority of wounds heal rapidly and painlessly under dry and infrequent dressing, uniform gentle pressure, and absolute rest." (Mr. Sampson Gamgee, Lancet, Aug. 5, p. 202.)

For some time I have used dry and infrequent dressings for my surgical cases in the Wigan Infirmary, and am well satisfied with the results. I have not been particular as to the material employed; sometimes fine oakum, at other times absorbent wool, and salicylic silk, have been used, neither did I mind having the wool made antiseptic, though no doubt this is an advantage where the discharges are fetid or unpleasant. In treating operation wounds I have striven to observe the *three* cardinal points—namely, (1) rest (2) drain-

age, (3) pressure, based on physiological laws, and so much insisted on by Mr. Sampson Gamgee, to whose kindness I am deeply indebted both for a supply of materials and many valuable suggestions. The convenience of this dressing can only be appreciated by the surgeon who constantly uses it, and, so far as my experience goes, the results will bear favourable comparison with other modes of treatment. In wound treatment we should particularly observe the three heads above-mentioned, for by employing a dry and absorbent material next the wound, with firm and equal pressure and drainage, so as to allow the escape of all fluids from the wound, we render the necessity for dressing infrequent, and have everything favourable for healing. Messrs. Southall Brothers, Birmingham, supply iodoform pads for surgical cases. They are exceedingly nice and light. It is much better to have the absorbent wool enveloped in a thin absorbent material so as to prevent its adhering to the wound. (Mr. Wm. Berry, p. 190.)

Iodoform Dressings.—For efficiency and safety I give preference to a solution of iodoform in absolute alcohol (1 to 10, after Esmarch), and a similar proportion of iodoform and collodion (Göges); the latter is a hæmostatic and antiseptic preparation of special value in the management of tracheotomy wounds during diphtheria, and of operations on the rectum and vagina. The eagerness with which different absorbent materials, variously treated with antiseptics, have been adopted by particular surgeons, offers a noteworthy contrast to the comparative indifference with which the general principles underlying simple and efficient wound-dressing have been apprehended. Immobility and perfect drainage, elastic compression, and infrequent dressings are the essentials. (Mr. Sampson Gamgee, p. 189.)

Salicylic Silk Dressings.—In giving notes of twelve cases treated by salicylic silk in the antiseptic dressing in the Edinburgh Royal Infirmary, Mr. Gibson says:—What led to the use of salicylic silk was the results obtained in the Leeds Infirmary, published in the *Lancet*. Our method differed from that used at Leeds in this essential—viz., in the use of no mackintosh. Next the wound was placed a piece of protective of as small a size as possible, and often perforated, as it was used merely to prevent the dressing from sticking to the wound; then two or three layers of carbolic gauze wrung out of 1 to 40 carbolic lotion; above that a variable quantity of salicylic silk; and over all a large dressing of eight plies of carbolic gauze. The large dressing we used to protect

the silk, which was looked upon as an aseptic though not antiseptic reservoir, and therefore required an antiseptic covering to prevent it from going wrong when moistened with discharge. It was not thought necessary to soak the deep dressing in a stronger solution of carbolic acid than the usual 1 to 40. The mackintosh was dispensed with because the use of the beautifully absorbent silk gave us the means of employing what Mr. Chiene had been long aiming at—viz., a dry dressing. The advantages found in the silk were—dryness of our wounds, lessening of discharge, diminution of labour to the surgeon, and cheapness. The absence of the mackintosh allowed the fluid part of the discharge to evaporate, and the dressings, when removed, sometimes not till two or three weeks after their first application, were found to be acting the part of a huge scab and to be covering a healed wound. The discharge was lessened because the poulticing action due to the mackintosh was absent. Our wounds in almost every case were drained with chromic catgut, that dressing might not be necessitated for the removal of a drainage-tube. Horsehair stitches were employed, as being more rigid than catgut; as keeping the lips of a wound in more perfect coaptation, and as being easily removed after a wound is healed. (Mr. J. Lockhart Gibson, *Lancet*, July 29, p. 137.)

Mr. Lockhart Gibson, in giving the results of cases treated in Mr. Chiene's wards by means of salicylic silk, states that the method of treatment adopted "differed from that used in Leeds in this essential—viz., in the use of no mackintosh." In this he is mistaken. Since I first brought this dressing before the notice of the profession, some eighteen months ago, I have used no other dressing in antiseptic cases, and *have always used it without the mackintosh*. I have reason to know that the practice of the surgeons of the Leeds Infirmary has been the same. Indeed, the chief advantage of salicylic over carbolic acid dressings lies in the fact that they can be used without the mackintosh; the wound is thus kept comparatively dry, putrefaction is less likely to occur, and early healing is induced. The only difference between the Edinburgh and Leeds practice seems to be that in Edinburgh the dressing is completed by covering the silk with a large pad of gauze; while in Leeds we dispense with the gauze pad, and substitute for it one of silk enclosed within two layers of gauze. This is a matter of little moment, but our plan has the advantage of economy, and a larger experience has shown it to be equally efficacious. (Mr. A. F. McGill, *Lancet*, Aug. 5, p. 203.)

Lawton's Absorbent Cotton-Wool.—Absorbent cotton-wool is the product of American ingenuity, and is thrown upon the market as a dressing suitable for every purpose where a dry surgical dressing is required. The sample of absorbent cotton-wool submitted to my notice was a piece of very finely carded cotton: upon comparing it with ordinary fine cotton-wool one was struck with the white, almost metallic, lustre of the former; upon squeezing the absorbent cotton it gives a rough crackling sensation very much like fresh fallen snow when pressed in the hand. This special wool possesses absorbent properties greatly in excess of ordinary cotton-wool, and this is not only in crystalloid but also in semi-colloid fluids, and it compares favourably with other wools made absorbent by the suspension of antiseptic or other crystalloid substances in their texture. It is the best medium for applying remedies in gynæcological cases; it is a valuable medium to apply such medicaments as styptics; it is a useful dressing when equalised pressure is required, and holds a prominent position as a dry dressing to small wounds without much discharge: but as an immediate dressing either to large wounds or wounds with a profuse amount of discharge its use is contraindicated. (Mr. R. Prosser White, p. 194.)

AFFECTIONS OF THE SKIN, ETC.

BURNS.—*Carbolic Paste.*—Dr. Schrady's formula for a carbolic paste, of great value in the treatment of burns, is as follows: Gum arabic, 90 parts; gum tragacanth, 30 parts; watery solution of carbolic acid (1-60), 500 parts; treacle, 60 parts; Mix. This paste is spread with a brush on the burnt part, and is renewed at frequent intervals. (Glasgow Med. Journal, Oct. p. 316.)

CARBUNCLE.—*Injection of Carbolic Acid.*—Dr. Charles Taylor calls attention, in the Australasian Medical Gazette, to the use of injections of strong carbolic acid into the substance of the carbuncle, as a very efficient means of causing it either to 'abort' or run a much shorter course than usual. He has employed this method with success in a number of cases where carbuncle occurred in persons enjoying good bodily health. An ordinary hypodermic syringe is used, and five or six drops of pure fluid carbolic acid injected. Linseed-meal poultices, fomentations, and constitutional remedies, such as the individual case may suggest, are also resorted to. There is little or no pain manifested on the part of the patient, and the acid seems to be retained where most needed, in the substance of the tumour, by coagulating the albumen in the surrounding tissues, and thus preventing absorption into the

system. Dr. Taylor's method, as he himself states, is by no means original, but is a modification of two other methods, that of Dr. Eader, who introduced threads saturated with a solution of carbolic acid in glycerin, and that of an American practitioner whose name he fails to mention, who injected half a drachm instead of five or six drops of the pure acid. (Practitioner, Sept., p. 220.)

[Dr. Peter Eadie's treatment of carbuncle by carbolic acid will be found in *Retrospect*, vol. 74, p. 279.]

ECZEMA.—In the more violent forms of itching, and particularly if it be at all what is understood as an acute attack, nothing has seemed to myself to afford more relief than wet heat. We know that the heat of the bed aggravates much the sense of itching: but it is otherwise with warm water, which rarely fails to give, at least, temporary relief. Though each person has their own special remedy to add to the hot water, I believe the relief arises essentially from the water, which it is best to apply as hot as the hand and the patient can bear. It is in the worst forms of itching that the remedy is of the most marked use; for when the case is of a more chronic character other remedies come into play. (Dr. H. Kennedy, p. 221.)

A preparation which in a great many instances mitigated, and in some had removed the itching was sweet milk combined with liquor plumbi subacetatis—one ounce of the solution to four ounces of milk. Milk thus combined with sugar of lead would keep perfectly sweet for two or three years. He agreed with what had been stated as to the comfort given by warm water. He once had an attack of eczema himself, being of a gouty diathesis; and after trying several local and constitutional remedies, he found that nothing but persistent bathing every night in water, as hot as he could bear, did any good. He had for four years a patch about the size of the palm of his hand on his left leg near the heel. He made an arrangement for keeping up a continuous application of the hot water for two or three hours at night; and then before going to bed he applied the milk and acetate of lead solution. In the course of a week the effect was marvellous. The scales disappeared; the skin began gradually to assume its normal appearance; and by perseverance in the treatment the scaly patch of eczema disappeared in the course of a month. (Dr. Cameron, p. 225.)

Great relief is sometimes obtained from the use of a weak solution of carbolic acid. (Dr. J. W. Moore, p. 225.)

The 'Banting' Diet.—The best results of Bantingism are, no doubt, seen in lymphatic infants; but it is also applicable to the chronic eczema, local or general, of adults. Mr. Squire would apparently restrict the employment of this diet to eczema. As a matter of fact, the Banting diet is of great value in other skin disorders, especially in the chronic skin affections of stout free-living patients about fifty years of age. I have now so frequently noticed improvement in cases of various kinds, not only skin diseases, by the omission of milk and an excess of saccharine and starchy food from the diet, that I venture to think that 'Bantingism' is not sufficiently made use of in these days. (Mr. A. Creswell Rich, p. 225.)

Vaseline and Oil of Cade Ointment.—During the last twelve months I have had in my practice two very severe cases of chronic eczema, which I treated by local applications of vaseline and oil of cade. The first case was that of a boy, aged eight years, whose trunk and thighs were covered with eczema since he was three months old, and who had been under the care of several medical men without deriving any benefit from their treatment. I prescribed the oil of cade ointment, and cod-liver oil and syrup of the iodide of iron internally. In six weeks the skin was perfectly healthy. The second case was that of a girl, aged twenty-two, whose entire body from head to foot was affected with the disease. The external treatment in this case was supplemented by the administration of arsenic internally. I admitted her into the Linton Cottage Hospital on Jan. 16, 1882, and she is now about to be discharged perfectly well. While in the hospital she was allowed a very liberal diet. The strength of the ointment I employed was two drachms to the ounce of vaseline. (F. C. Berry, M.B.Dub., British Medical Journal, June 3, p. 817.)

Salicylated Starch.—Kersch has recommended salicylated starch in the treatment of eczema. It is prepared by mixing starch gradually with salicylated alcohol of a strength of 2 per cent., allowing the starch to sink to the bottom, pouring off the supernatant temperature of 80° C. In treating eczema it is recommended that after the scales have been removed the patches should be dried with antiseptic cotton-wool, then moistened with a 2 per cent. solution of salicylic acid in alcohol, and afterwards covered with a thick layer of salicylated starch. (Lancet, Aug. 26, p. 326.)

Animal Charcoal.—Chatterjee (in the Indian Med. Gazette) recommends for use in eczema an ointment made of two drachms of powdered animal charcoal to one ounce of

freshly-prepared simple ointment. The charcoal is made from bones, leather, old shoes, and cuttings of horses' hoofs. It is specially useful in vesicular eczema of the limbs. (Practitioner, Aug., p. 143.)

Eczema, Intertrigo, Erythema of Infants, Fætid Feet.—*Vaseline and Boric Acid Ointment.*—M. Championnière recommends an ointment of vaseline and boric acid as a non-irritant antiseptic. It is particularly useful for those wounds which it would be important not to irritate. It is very advantageous as a local application in eczema and intertrigo; and in the erythema of infants provoked by the prolonged application of soiled linen, or from other causes, there is no better remedy. Its disinfecting action, though not very powerful, is sufficient. He also employed it with great success in feet that emitted a bad odour. The ointment was applied between the toes, and the effect was almost instantaneous. The formula of the pomade is:—Boric acid, 3 jss.; vaseline, 3j. The acid should be employed in fine powder, and incorporated with the vaseline, and not dissolved in alcohol or glycerine, which renders the pomade irritant. (M. Lucas Championnière, Medical Press and Circular, Oct. 4, p. 282.)

HERPES ZOSTER.—*Neuralgic Pains.*—*Oil of Peppermint.*—I have found the oleum menthæ pip. more effective than any other form of anodyne application I have tried in allaying the neuralgic pains so often piteously complained of in cases of herpes zoster. These distressing pains—worse in elderly people—are complained of often when the eruption has disappeared; but painting the affected parts over with oleum menthæ pip. nearly always affords speedy relief. I have painted the oil over the eruption when it was out in a fresh florid condition, and that with great relief to the patient. The value of this application in pains of neuralgic character deserves to be better known than it is. (Dr. Meredith, Birm. Med. Review, June.)

PRURIGINOUS AFFECTIONS.—M. Lailier recommends the following: Carbolic acid, 2 parts, neutral glycerine, 5 to 10 parts, distilled water, 100 parts. It should be applied either by means of compresses soaked in the lotion, or the lotion may be administered by pulverisation, (Practitioner, May, p. 372.)

PSORIASIS.—*Internal Use of Chrysophanic Acid.*—The results of experiments with chrysophanic acid given internally in cases of psoriasis are encouraging. In some obstinate cases, which resisted arsenic and external applications, small doses of the acid rubbed up with sugar of milk were administered after each meal. Half-a-grain is a good dose to start with,

and this may be gradually increased until signs of gastrointestinal disturbance appear. Patients vary much in their tolerance of the drug; a girl of 13, in Prof. Charteris' ward, took nine grains a day in one-grain pills without trouble; others soon reach their maximum dose, and then the treatment must be suspended or the amount reduced. In nearly all the cases the improvement in the skin disease has been marked and rapid. The greater ease and cleanliness of this mode of application of the remedy are obvious. In the interests of all it is desirable that the favourable conditions and methods of administration should be fully made out. (Dr. Napier, Glasgow Med. Journal, June.)

RINGWORM.—Wash, or more strictly dab, the patch each morning with ether, rectified spirits of wine, and thymol, in the following proportions: ether, five drachms; rectified spirits of wine, two drachms and a half; and thymol, half a drachm—applying during the day glycerine with a very small trace of perchloride of mercury. Petroleum may be used in the place of the ether and spirit. One drachm and a half of petroleum-oil takes up five grains of thymol. The ether or petroleum is of greater value than would at first sight appear, and for the following reason. There is a disease of the scalp known as *seborrhœa sicca*, the chief characteristic of which is the falling out of the hair. This is caused by the absence of the natural fat in the sebaceous matter. It is cured by stimulating the glands to action, and by adding fat artificially. In the ringworm patch, we want the diseased hairs to fall out; and, by producing a condition similar to *seborrhœa sicca*—that is, by making the part very dry—we can actually produce this effect. Instead, therefore, of epilating by means of forceps—which is useless, as the hair breaks at the neck of the follicle, leaving the diseased part behind—we can epilate by dissolving the fat, and thus loosening the hair. In this way, we can in a few days remove all the broken and diseased hairs. (Mr. M. Morris, p. 230.)

Boracic Acid Solution.—Thinking that the accumulation of sebaceous matter and epithelial *débris* in all probability prevents the penetration of remedies into the follicles, which are further blocked by the swollen diseased hairs, and that it should be our object to bring any parasiticide into contact with the most deeply seated fungus, it occurred to me that we might attain this end by the employment of a parasiticide held in solution in a fluid which should also dissolve fatty matters. It certainly seemed to me desirable to exclude fatty and oleaginous materials from the remedy, and to apply this in solution—*i.e.*, the minutest form of subdivision.

Accordingly, I determined to employ a solution of boracic acid, twenty grains in an ounce of spirit, to which a drachm of ether was added; and directed this lotion to be forcibly rubbed into the affected parts of the scalp with a rag or moderately stiff brush three times daily, the whole head being ordered to be washed every morning with plenty of hot soap and water. The result of this treatment in severe chronic uninflamed cases is certainly excellent, when it is faithfully carried out. The frosted scaly aspect of the diseased patches is soon replaced by healthy-looking scalp; the broken and twisted hairs appear to be removed; and a healthy growth makes its appearance. When the scalp is seen shortly after the application of the remedy, it is found to be shining, owing to the presence of a fine glaze. This, I presume, consists of dissolved sebaceous matter mixed with boracic acid, deposited in a thin film after evaporation of the solvent; and for this reason I think its removal by soap and water is a necessary adjunct to the treatment. This would, perhaps, be best effected by alkaline spirit of soft soap. (Dr. John Cavafy, *British Med. Journal*, June 24, p. 939.)

Oleate of Copper.—The ointment of the oleate of copper, a new addition to the oleates, a beautiful green ointment having the same consistence as the benzoated oxide of zinc ointment, is recommended by Dr. Shoemaker, in the *Medical Bulletin*, as having a decided action in destroying the parasite of this disease. Each patch of the ringworm should have the ointment of the oleate of copper rubbed in thoroughly, night and morning. The oleic acid, in combination with the copper, has a more decided action in penetrating the hair follicles than any other remedy he has ever before used to destroy the parasite. (Dr. Shoemaker, *Dublin Journal*, April, p. 363.)

SCABIES, ICHTHYOSIS, AND PRURIGO.—*Naphtol.*—More than a year has elapsed since this remedy was introduced by Kaposi, and he has since employed it in more than 1,000 cases. In none of these did any untoward result manifest itself; still he recommends that the drug should be used with certain precautions, and that β naphtol only should be prescribed and dispensed. It is specially useful in the treatment of scabies, of ichthyosis, and prurigo. In *scabies*, one inunction with a salve having the following composition is sufficient to cure: *Rx.* Adipis vel. ung. simp., 100; saponis mollis, 50; naphtol, 15; cretæ preparatæ, 10. *M.* Ft. ung. If there is no great amount of eczema complicating the scabies, even hospital patients can be discharged after one day's treatment; and even when severe eczema is present it more rapidly disappears than when other modes are employed. In infants or

young children the proportion of naphthol should be reduced to 10 per cent. or 5 per cent. In *prurigo*, both *mitis* and *agria*, the results have been extremely satisfactory. An ointment of 5 per cent. naphthol is to be rubbed each night into the extensor surfaces of the upper and lower extremities, and on the sacral region, where the *prurigo* papules are mostly found, and the parts thereafter dusted with powder. In children between the ages of 2 and 7, every or every other evening the child is washed with a naphthol and sulphur soap in a warm bath, the parts affected with *prurigo* being firmly rubbed, and in an hour the soap washed off with ordinary toilet soap, carefully dried, and 3 per cent. naphthol ointment smeared on. This is also used on those nights when no bath is given. When improvement occurs, usually within from one to three weeks, the frequency of the applications must be diminished. Equally convincing were the effects of its use in *ichthyosis*. The patients were rubbed once or twice a day with a 5 per cent. naphthol ointment, and the skin soon became smooth and pliant, while any complicating patches of *eczema* rapidly disappeared. In more severe forms, a course of frictions with 2 per cent. of naphthol to soft soap, and occasional baths with naphthol sulphur soap, was persevered in till a moderate degree of epidermic peeling occurred, then the inunction with 5 per cent. salve was commenced. Both *prurigo* and *ichthyosis* demand continuous attention to the skin, even when no lesions are seemingly present. It suffices in general to take a bath once or twice a week with the naphthol soap, and every second or third day to apply the naphthol salve. When the patient first comes under observation with a weeping, encrusted *eczema*, this must be treated, and the *eczema* reduced to a more quiescent stage, before the naphthol is commenced with. Naphthol is also useful in *psoriasis*, in *acne*, in *seborrhœa*, and in *hyperidrosis*. *Acne* can be treated by washing at night with the naphthol and sulphur soap, allowing the latter to dry on and remain during the night, to be washed off in the morning. These medicated soaps can be obtained from C. von Waldheim, apothecary, Vienna. (Dr. W. A. Jamieson, *Edinburgh Medical Journal*, Nov., p. 456.)

Chlorinated Oil.—At the American Hospital for Skin Diseases, chlorinated oil, a yellowish oily fluid prepared by passing chlorine gas into olive oil, has been found to be a most decided parasiticide, more particularly in *scabies*. In this affection a piece of cotton is saturated with the chlorinated oil, and applied night and morning. The preparation is also used in other cutaneous diseases. (*Glasgow Med. Journal*, Oct., p. 311.)

SPONGE GRAFTING.—The first experiment was on a woman suffering from an ulcer on the leg five inches in diameter. The wound was filled with one large and several small pieces of sponge, prepared by dissolving the siliceous and calcareous salts by means of dilute nitrohydrochloric acid, subsequently washing in liquor potassæ, and then steeping for some months in a 1 in 20 solution of carbolic acid. There is, however, no necessity for steeping it for so long a time. The sponge in the central part of the wound rose a little higher than the edges, so that at its greatest thickness it must be measured at least from half to three-quarters of an inch, and five inches wide. It filled accurately, and was inserted under the undermined edges. Over this was placed protective—some lint soaked in a 1 in 20 solution of carbolic acid in glycerine, and then a pad of boracic lint. Next day it was re-dressed; on the following there was distinct putrefactive odour, and the wound and sponge were irrigated with a 1 in 40 carbolised solution. On the fifth day the wound seemed to have shrunk a little, and there was little putrefactive odour. The thin parts of the sponge felt very firm, and the interstices were evidently filling with organised tissue. If the surface was pricked, it bled freely. Healing seemed to be going on from the edges and from below upwards. From this onwards the sponges rapidly filled with organising tissue, and there was only a small portion of it to be seen on the surface. As soon as it became vascular the epithelioma spread over it. On the 29th Nov. (the experiment began on the 3rd August) the circumference of the limb which had healed was 21 inches, while the measurement of the other limb was 19. The cause of the increase was the tumour-like mass of new tissue which had now supplanted the sponge. Several other ulcers were similarly treated. In another case sponges were placed in the gap caused by the removal of a large recurrent cancer of the mamma. In this case the wound and the sponge remained aseptic. (Mr. D. J. Hamilton, Dublin Journal, March, p. 215.)

ULCERS OF THE LEGS.—Any acute inflammatory complication must first be allayed by rest in the horizontal position:—this is imperative. Combined with rest, starch poultices give most relief. These should be made of Glenfield starch, prepared as for starching linen, and allowed to cool, when it sets into a transparent jelly. This is thickly spread on a piece of rather thickish old cotton of a suitable size, covered with muslin, and the inflamed part enveloped in it. This forms a delightfully cool and soothing application, which retains its moisture for a considerable time, but should be renewed ere it becomes hard. Never apply a starch poultice hot. Always

allow the starch to set before using it. Another method, an excellent one when the discharges have become fetid, is to dress for some days with boric lint and lotion, which soon renders the part sweet and the discharges inodorous. Two plans are now open to us, and sometimes one, sometimes the other, suits best. In most cases strapping with bands of adhesive plaster *cut lengthwise*, so that the plaster will not stretch, answers best. This treatment seems to have fallen, in these days of antiseptics, undeservedly into disuse. I had, many years ago, an opportunity of seeing some hundreds of ulcers of the leg in the workhouse at Preston. All were treated most satisfactorily on this plan. The strips must be smoothly applied from below upwards, and directly to the ulcerated surface. The lower edge of the lowest strip should be snipped in one or two places, so as to prevent its cutting the skin. The strips are to be changed, at least until the discharge very much diminishes in amount, every day. Over the plaster, from the toes to the knee, a roller bandage is carefully applied. The best bandage is the so-called *water-dressing bandage*, open weave cotton, with *torn* edges. Sometimes a domette flannel answers better. The bandage should be secured with a safety-pin, not tied, below the knee. These seem trivial details, but success depends on attention to minutiae. It is quite wonderful the relief afforded by this treatment, while it enables the patient to move freely about. The other mode is to envelope the legs in Martin's solid rubber bandages, and when the skin will stand this without blistering, the results are excellent. Some persons, however, cannot bear the heat the bandage causes. Use always the *genuine* ones. Dr. Martin says that the rubber employed must be thoroughly 'cured,' and the bandage prepared with a minimum of sulphur—directions which do not seem to be followed out by the makers here. His are now made thinner than at first, and these thin ones answer well if no great strain is to be put on them; but the stronger and thicker ones will be found in cases of extensive ulcer the best, most serviceable, and the cheapest in the end. The bandage must be put on before rising from bed in the morning, ere the limb swells; removed at night, and the ulcer dressed with some boracic lotion, gutta-percha, and roller. This is generally better than an ointment, as oily matters rot the bandage, and patients are apt to be careless in wiping off the salve before applying the bandage in the morning. The boracic acid has the advantage of keeping the sore sweet; for when the rubber bandage is taken off, the pent-up secretions of the limb and ulcer too often are most offensive. The leg should be bathed with tepid water at night, and gently dried before

being dressed, and the bandage itself rinsed through warmish water and hung up to dry on a line or towel-rail. The bandage replaces most admirably the elastic support of the skin which had become defective, and indeed in time in a great measure restores this, provided the state of the general health, the condition of the bowels and kidneys especially, be attended to, and any error in occupation remedied as completely as possible. (Dr. W. Allan Jamieson, p. 226.)

VENEREAL AFFECTIONS.

BUBO.—*Abortive Treatment by Carbolic Acid.*—Dr. Morse R. Taylor in American Med. Journal speaks in terms of high praise of the injection of a watery solution of carbolic acid into inflamed glands. The strength of the solution he has used has varied from four to sixteen grains per ounce, and the quantity injected from ten to forty minims. He states that if injected before suppuration has occurred it will prevent that result, and if injected after aspiration of a suppurating gland it will prevent all resecretion of pus, while in all cases alike it relieves the pain in a few moments permanently, and is followed by the rapid resolution of the inflammation. Dr. Taylor recommends that the skin be refrigerated with the ether spray, and care taken to introduce the point of the syringe into the centre of the inflamed gland. (Lancet, May 13, p. 797.)

CHANCER.—*Glycerinum Boracis.*—In various forms of skin disease a simple non-irritating antiseptic application frequently leads to a speedy recovery. Amongst antiseptic substances borax is eminently useful in cutaneous affections. The sloughing appearance of a chancre and its inflamed base, naturally suggested to my mind the action of a poison which was rapidly multiplying itself, and on the chance of the poison being parasitic—being a ‘germ’—I bethought myself of an anti-parasitic (or antiseptic) remedy and directed the sore to be kept bathed in glycerinum boracis. With the borax solution the inflammation speedily subsided, the surface became clean, and the ulcer healed without a troublesome symptom. Whilst this sore was being successfully treated a vesicle appeared on the fourchette. It soon ruptured and left a small chancre, which did not spread laterally, but penetrated into the tissues. When my attention was called to it, a probe passed inwards for a quarter of an inch. I directed a solution of carbolic acid in alcohol to be applied, but this failed to get to the bottom of the sore, which continued to get deeper. I then procured proper instruments for the patient, and instructed her attendant how to plug the narrow chan-

nel with cotton wadding soaked in glycerinum boracis. From that time the canal-like sore began to fill up from the bottom, and soon healed completely. (Dr. George Thin, p. 245.)

CHANCROIDS IN THE FEMALE.—Iodoform.—My treatment of chancroids in the female has been modified very much, and latterly simplified, and also, I am sure, much improved, since the introduction of iodoform as a remedy. I used to cauterize these sores, especially when phagedænic, destroying them with caustic potash or chloride of zinc. Now I simply dust them with iodoform powder and keep them dry, and they invariably heal up in a few days. Iodoform is specially useful in the female on account of its power of diffusing itself and penetrating into corners. Formerly, with the caustic treatment, I was never certain that I had destroyed all the sores, and knew that if one was left the chancroidal action would reproduce itself. Now I can be perfectly certain that if I put on the iodoform freely the disease will be thoroughly checked. The action of iodoform on phagedænic sores is even more remarkable than on ordinary chancroids. My experience is that 24 hours, or at most 48, are quite sufficient to establish a healthy action in the sores. I use the iodoform pure, the crystals being pounded to a fine dust, which is blown on the parts affected by means of an instrument which consists of a wooden tube, widened out at the centre, where the powder is placed, and then blown out at the nozzle by pressure (with the thumb) on the indiarubber ball placed at the other extremity. When the labia are held aside by means of Dr. Henderson's forceps in the hands of an assistant, the surgeon can blow any quantity of the powder that may be necessary directly on the affected parts, and as these are always damp, a sufficient quantity of the iodoform adheres to destroy the septic action of the sores. If all the sores are not reached at first, a second or third application may be necessary. Generally there was sufficient dusted on to act on all the sores, even those that were out of sight. Chancroids on a syphilitic person run an ordinary course, but are apt to be followed by condylomata.

To Disguise the Odour of Iodoform.—As the great drawback to the use of iodoform is its disagreeable and persistent odour, the following mixture for covering the odour will be valuable to the profession. It is the invention of Mr. Charles Arthur, the chief dispenser to the Royal Infirmary:—Iodof., ʒij.; ol. eucalypt., ℥15: ol. verben., ol. mirbane, ol. lavand., ol. limon., āā ℥5; M. This mixture does not in any way interfere with the use of the iodoform as a powder. (Mr. A. G. Miller, Edin. Med. Jour., Nov., p. 399.)

GONORRHOEA.—*Abortive Treatment.*—The materials which I have employed with the view of destroying the cause of gonorrhœa are chiefly iodoform and eucalyptus oil. As injections are apt not to penetrate sufficiently far, and their effect is only momentary, I combine these substances with cocoa butter, and make them up in the form of solid rods about 4 in. or 5 in. in length, and about the thickness of a No. 10 catheter. These rods weigh forty grains each, and each contains five grains of iodoform and ten minims of eucalyptus oil. They are dipped in eucalyptus oil, introduced into the urethra, over the orifice of which a pad of boracic lint is applied, and outside this a large piece of gutta-percha tissue, the whole being fastened on by strapping, and retained for four or five hours if possible. The cocoa butter soon melts, and a solution of iodoform in eucalyptus oil bathes the mucous membrane for some hours. Another rod may then be inserted, and a suitable injection employed afterwards. This method is only of use before or during the inflammatory stage, and I employ it at any time until the inflammatory symptoms have disappeared, but generally within the first seven or eight days after the commencement of the discharge. The use of one or two iodoform and eucalyptus rods, an injection of sulpho-carbolate of zinc, and the internal administration of copaiba—has the effect, in the great majority of cases of acute gonorrhœa, of checking the acute symptoms in a day or two, and bringing the disease rapidly to the chronic stage, thus avoiding all the risks dependent on the violence of the inflammation. The discharge at this time is very amenable to treatment, and gets rapidly well under the use of suitable remedies. All that I claim for the method is that it cuts short the acute stage in the great majority of cases, and thus the patient escapes the dangers and pain incident to that stage. The essential parts of the method are the use of the bougie and the injection; but the rapidity of cure is much aided by commencing the use of copaiba or sandal oil at once. The method may be employed at any stage of the disease, but is, in my experience, only of use before or during the acute stage, up to (say) the eighth day. The result is the more marked the more acute the inflammation, the rapid subsidence of the inflammatory symptoms being very striking. Even in the very few cases in which it has failed to produce this effect, it has not, so far as I can judge, done any harm. The addition of bichloride of mercury, though a powerful antiseptic, to the rod, or its use in the form of injection, does not seem to be of advantage. It is possible that the combination of counter-irritation with this method may yield even more rapid and satisfactory results. (Mr. W. Watson Cheyne, p. 247.)

Through my connection with the Contagious Diseases Act at Woolwich, I had special opportunities of observing this malady. I arrived at my conviction as to the best mode of treating it on the following data. Firstly, two diseased surfaces in contact and close apposition with each other are unfavourably placed for recovery, therefore I separate the walls of the inflamed urethra by ordering injections of hot water to be retained for twenty minutes or longer when practicable; but as the fingers would become cramped from holding the extremity of the penis for that purpose, Messrs. Krohne and Sesemann have made me a simple spring forceps that conveniently takes their place, and, moreover, thus liberates the hands, which may be employed to hold a book, &c., to while away the tedium. Secondly, the gonorrhoeal discharge being capable of producing the disease when applied to a mucous surface, it is not unreasonable to suppose that its retention within the urethra must very largely perpetuate and exaggerate the inflammatory condition and stage; therefore the injections already recommended, when frequently used, will have a salutary effect in this respect also. Thirdly, it being well known that hot fomentations and poultices are soothing and emollient in all acute inflammations, it follows that hot injections within the urethra and hot baths and the application of flannels wrung out of hot water to the parts externally must be very beneficial. And, lastly, certain drugs that have a styptic effect upon the genito-urinary mucous tract are plainly indicated. But experience proves that they can only be administered with benefit after the more acute symptoms have subsided. I therefore give the liq. copaivæ comp. of Messrs. Hewlett and Sons when that stage has been reached, which is generally the case within a few days under the treatment indicated, and at the same time add three drops of liq. plumbi to each ounce of the injection, which must now be made with distilled water, and used less warm, or altogether cold. In some cases weak injections of nitrate of silver or chloride of zinc may now be of great use. I need scarcely add that the regimen, alimentary and medicinal, must be strictly non-inflammatory in the acute stage. The *modus operandi* of Mr. Cheyne's treatment and mine is very much the same—viz., separation of the walls of the urethra, dilution of the discharge, and lubrication of the inflamed surfaces with the cocoa-butter bougies. His objection to injections that their effects "are only momentary" cannot apply to the manner in which I recommend them. (Dr. Beresford Ryley, formerly Assistant Visiting Surgeon at Woolwich, under the Contagious Diseases Act, Lancet, Aug. 12, p. 253.)

In the abortive treatment of gonorrhœa, I have used two-drachm doses of sandal-wood oil three and even four times a day in the prodromatory and inflammatory stages of the disease, especially in 'primary cases,' with well-marked results. The purulent secretion has been completely arrested within thirty to forty-eight hours, rarely continuing on to seventy-two hours. I have followed up the cessation of the discharge for three or four days by urethral injections of chloride of zinc (preferring the liquor of the British Pharmacopœia in the preparation of the same), as, in some instances where I omitted the injections, I found the discharge reappear on the discontinuance of the oil. By this method of treatment the inflammatory sequences are reduced to a minimum. I do not recollect whether the remedy has ever been suggested before, but in my Indian experience I have obtained very beneficial results in the treatment of *paroxysmal hæmaturia* with large doses of the oil, though not so large as those suggested above. (Dr. C. H. F. Underwood, Lancet, Aug. 19, p. 296.)

The treatment I have found best may be summed up as follows:—Internally, three minims of the oil of turpentine and one ounce of infusion of buchu, three times daily. Locally, warm-water injection, followed directly by the following: Two drachms of hydrastis Canaden., two drachms of subnitrate of bismuth, and four drachms of glycerine, with sufficient water to make four ounces, which should be retained in the urethra as long as possible. The nitrate of silver, sulphate of zinc, &c., locally I found worse than useless, and from personal experience I should certainly never prescribe any of them. (A Student, Abergele, Lancet, Aug. 19, p. 296.)

SYPHILITIC OZÆNA, ULCERS OF THE MOUTH, NOSE, &c.—*Iodoform*.—I consider iodoform the most valuable addition to the treatment of venereal diseases that we have had for many years. I have found it very useful in the later manifestations of syphilis, such as ozæna, ulcers of the mouth, nose, &c. For these cases I use it as a fine powder dusted on, or suspended in vaseline or glycerine, in the proportion of from gr. x. to ʒj. in the ounce. I have used the drug very freely, and have never seen any bad effects; but as the application has almost always been to suppurating, and therefore non-absorbing surfaces, effects upon the system are not likely to have occurred. (Mr. A. G. Miller, Edinburgh Med. Journal, Nov., p. 402.)

AFFECTIONS OF THE EYE AND EAR:

ATROPINE OINTMENT.—The ordinary atropine solution, as I have frequently found, becomes turbid in a few days from the growth of micro-organisms. It is naturally an objectionable form of treatment to bring such a solution into contact with a recent corneal wound, whether produced surgically or otherwise. For this reason I have ceased using atropine in this form for the treatment of in-patients; and I believe that an ointment made by combining gr. iv—viii of sulphate of atropia to 3i of vaseline is a much more satisfactory method of application. Besides being practically aseptic, it has other advantages. It can be applied to the outer surfaces and edges of the closed lids with perfect efficacy. This fact I have tested frequently and consider to be of some importance, especially in the after-treatment of cataract operations, where it is of great importance to disturb the eyes as little as possible. Again its action is more constant than that of the solution, and lasts for a longer period. This point was shown very clearly in a case of interstitial keratitis with much photophobia and lacrimation, for directly the atropine solution was dropped into the eyes, a flood of tears washed it away, and its action was *nil*; one application of the atropine ointment dilated the pupils fully. (Mr. W. J. Milles, Ophthalmic Hospital Reports, Aug. p. 387.)

AURAL POLYPI.—*Alcoholic Treatment.*—Prof. Politzer says that the efficiency of the alcohol treatment is very marked in granular or polypoid growths situated in the external auditory meatus, in the tympanic cavity, or on the membrane itself. He commences by evacuating the pus, and then cleansing the parts by injection of tepid water. By means of a wad of cotton, the portion of fluid remaining is removed. This done, and the head of the patient being inclined to one side, the alcohol, slightly warmed, is poured by a spoon into the external meatus, and is kept there for ten or fifteen minutes at least. The instillation of the liquid generally causes simply a sensation of warmth, rarely a sharp pricking or heat; this is always of very short duration, and only occurs in the early days of the treatment. In the case of great pain the alcohol is diluted with its own volume of distilled water. The instillation should be repeated three times a day. After a certain time, if the regression of the morbid growths allows it, two, and finally one instillation a day may be made. Immediately after the application of the alcohol the granulations or polypi, which were of an intense red, become pale and grayish-red. This is owing to the coagulation of the mucus and albumen. Later, the contents

of the vessels in the superficial layers coagulates in its turn, which causes retraction of the tissues. The action of alcohol is independent of the structure of the morbid growths. Fibromata contract and disappear as surely, though more slowly, than round-celled polypi. The author cites numerous cases treated with success. In many cases the action of alcohol is rapid; most often, however, the neoplasms only disappear after weeks, or even months, of regular continuous treatment. The practitioner should remember this fact, so that he may not abandon the alcohol treatment because after some weeks cure has not taken place. The following, according to the author, are the indications of treatment by rectified alcohol:—1. The remains of polypi in the external meatus, on the membrane, and especially in the tympanum, which cannot be extracted by operation. 2. Multiple granulation in the external ear and on the membrane. 3. Diffuse and considerable proliferation of the mucous membrane of the middle ear. 4. Polypi of the external meatus, which, owing to mechanical obstacles, cannot be removed with instruments. 5. In persons who dread operations, and in children, in whom operation is always difficult, and can very often only be practised in cases of necrosis. (Edinburgh Med. Journal, May, p. 1032.)

ECZEMA OF THE EXTERNAL AUDIDORY CANAL.—This may sometimes persist for a long time without being recognised, there being only moderate redness, together with considerable scaling and some itching, both consequent upon the infiltration. For this the ear will be syringed again and again, only to have the canal fill up as before with rather greasy scales. This condition yields, as a rule, completely to tannin ointment, a drachm to the ounce, put thoroughly and deeply in the meatus by means of a camel-hair brush. As in the treatment of eczema elsewhere too much washing does harm, so in eczema of the external auditory canal too frequent syringing is harmful. Every few days, if there is too much accumulation of scales and ointment, it may be syringed out with a little borax or soda and water, and the ointment immediately replaced. If the condition resists this treatment, dilute citrine ointment may be used, or the canal may be painted with a weak solution of nitrate of silver in sweet spirits of nitre. In the main, however, reliance may be placed upon the faithful use of the tannin ointment. (Dr. L. D. Bulkley, Edinburgh Med. Journal, July, p. 79.)

GLAUCOMA.—*Eserine.*—I have for several years made use of eserine in the treatment of glaucoma; and much has been written on the subject by ophthalmologists in all parts. As to

its value in certain cases of acute glaucoma there can be little doubt. Several such have been recorded. It is difficult to judge beforehand as to the precise case that will benefit by this drug. I apprehend therefore, that, in this acute affection, its employment will be limited to those cases where, either from unwillingness on the part of the patient to submit to iridectomy, or other reason, the immediate performance of the operation is forbidden. Experience teaches the importance of not placing too strong reliance in the efficiency of the drug to the fatal postponement of the operation; and it seems to me particularly important to urge this, as those who do not see much of eye-diseases may be tempted, observing the very satisfactory results occasionally recorded, to resort to the use of eserine when operative measures should have been considered. A one per cent. solution of eserine to be dropped into the eye four times daily. (Mr. Simeon Snell, p. 258.)

IRIDOTOMY.—A simple modification of this operation suggested itself to me, and seems to possess some advantages. It consists in making the corneal incision in a radial manner, the outer end being at the corneo-scleral margin; that is to say, it is at right angles to the ordinary incision in the circumference of the cornea. The resulting scar is of course far external to the axis of vision. The advantages I have noticed are, 1st. That the incision in the cornea can be much more limited, and proportionally gives more play to the scissors. 2nd. That the knife can be plunged directly through the iris in the direction previously decided. 3rd. That the scissors are introduced and remain in the same direction, and, consequently that they completely fill up the corneal incision and so prevent any escape of vitreous. In the ordinary operation the scissors have to be turned through a quarter of a circle, and necessarily make the incision gape to its utmost extent, thus allowing a free escape of vitreous. (Mr. W. J. Milles, Royal Ophthalmic Hospital Reports, Aug., p. 388.)

OPHTHALMIA.—*New Syringe for Injecting Vaseline.*—A glass syringe, manufactured by Krohne and Sesemann is used by Mr. Bader of Guy's Hospital for the treatment of gonorrhœal, purulent, and other forms of ophthalmia. The object is to inject vaseline ointment beneath the upper eyelid, passing the nozzle beneath it close to the outer canthus. To charge the syringe, the piston is withdrawn, and the ointment put into the tube with the finger or spatula. The widened upper end of the tube facilitates the entry of the ointment, and the manipulation of the syringe, if rendered slippery by the ointment. (British Med. Journal, Oct. 14, p. 741.)

PURULENT OPHTHALMIA.—*Iodoform.*—In purulent affections of the conjunctiva and cornea, I believe that iodoform, in suitable cases, is of very great service. The best method of using it is either in a very fine powder, when care should be taken that it is ground down very thoroughly; or in the form of ointment of variable strength, the usual form being gr. xxx to ʒj of vaseline, the stronger form ʒj to ʒj. It produces less pain and irritation than any other antiseptic that I am acquainted with; it can be used in a concentrated form; and it volatilises very slowly. I gave it an extended trial in ophthalmia neonatorum, and came to the opinion that it was only useful when one could treat the disease from the commencement (within the first two or three days). In the later stages when there was thickening of the lids, and a granular condition of the conjunctiva, I found that its effects in stopping the purulent discharge were very slight. I was more pleased with iodoform in the treatment of gonorrhœal ophthalmia, possibly from the fact that the patients suffering from this affection were more immediately under control. The treatment was combined with the use of boracic acid lotion, or a solution of perchloride of mercury (gr. i. to ʒj.), and, of course, a constant application of iced compresses. In a number of cases the acuteness of the swelling and the profuse discharge rapidly diminished, and the cornea was saved under this form of treatment. Having seen the rapidity with which an indolent ulcer of the leg changes its character under the use of iodoform, I was led to try its effect on the slowly-spreading infiltrated ulcer of the cornea. It quite answered my expectations. In several cases, with the constant application of iodoform, the ulcers ceased to spread, the infiltration of their edges rapidly disappeared, and a rapid recovery ensued. (Mr. Milles, Ophthalmic Hosp. Reports, Aug., p. 386.)

STOPPAGE OF THE CANALICULUS BY DACRYOLITHS.—Concretions formed by the deposit of the saline elements of the tears are but rarely observed. In the American Journal of Medical Science the case of a man, aged forty-six, is reported which came under the observation of Dr. H. G. Cornwall, complaining of an interference with the escape of the tears from the left eye, which had annoyed him for ten years. An examination revealed lachrymal conjunctivitis, the lachrymal punctum slightly everted, its orifice of normal size, and the walls of the canal somewhat thickened. No accumulation of tears in, or any evidence of inflammation of the lachrymal sac. Suspecting a stricture of the canaliculus this passage was slit up by means of a delicate pair of scissors, one blade of the instrument passing readily through the canal without obstruction. On the following day on attempting to separate the edges off

the incision, in order to prevent their union, by means of Bowman's probe held vertically, the instrument struck a gritty substance, which proved to be one of four dacryoliths which were arranged bead-like along the floor of the canal. The canal itself after their removal was found to be much enlarged as a result of this calcareous deposit. (Dublin Journal of Med. Science, Sept., p. 238.)

TINNITUS AURIUM.—*Nitrite of Amyl.*—Dr. J. Dana Littlefield, U.S., states that he has used the nitrite of amyl in his own case for tinnitus aurium. On inhalation, the character of the sound became modified (lighter), longer intervals of ease ensued, and finally a decided sense of inexpressible relief, with a feeling of positive change on the affected side. The dose (about ten minims) was followed by no discomfort or untoward symptoms, but, on the contrary, by an increased exuberance of spirits, perhaps due in part to the achievement of a happy relief. (Practitioner, May, p. 378.)

MIDWIFERY, ETC.

DISPLACEMENTS OF THE UTERUS.—Dr. Vedeler has examined not only women who complained of pelvic troubles, but women who appeared, and stated themselves to be perfectly healthy, and in whom no disease could be found. All women who complained of pelvic trouble, or in whom erosion, perimetritis, or tenderness around the uterus was discovered, were classed among the sick. The total number examined was 3012. Of the 466 virgins, 52 were suffering, and 414 enjoyed good health. The percentage of those in whom the uterus was found in the various positions which it may assume was much the same in the healthy as in the suffering; but it is curious and important to note that the so-called normal position was met with in only 7 per cent. of the healthy, while it was found in 6 per cent. of the complaining; ante-flexion, however, was found in 71 per cent. of the healthy, and in 70 per cent. of the ailing. The highest proportion of cases of the so-called normal position is found in those who have had children, as well as the lowest proportion of ante-flexion. Both conditions are, however, met with almost exactly the same frequency in disease as in health. It is further found in virgins, nulliparæ, and mothers, that although child-bearing has an influence on the position of the uterus, yet the frequency with which any given position of the uterus occurs in health is so nearly the same as the frequency with which it is met with in disease, that it is not possible to charge so-called displacements with being the cause of any symptoms. (Dr. Vedeler, p. 282.)

EUCALYPTUS PESSARIES.—Oil of eucalyptus as a substitute for carbolic acid where the latter was inadmissible, it occurred to me it might be more extensively employed in obstetric practice than had been considered safe with carbolic acid. I have put it to the test, and find its advantages are: 1st, It is non-poisonous. 2nd, In the quantity and strength required it is unirritating. 3rd, It does not coagulate the lochia, which, by separating the lips of the vulva, can be seen to flow out in a liquid stream. 4th, Its odour is with rare exceptions a pleasant one. 5th, It seems to act as a uterine stimulant, causing and assisting to maintain uterine contraction. Formed into a pessary of a suitable shape and size it is easily applied to the neighbourhood of the os, and retained there. To secure this, the pessary must be broad and short, must melt slowly but completely, and must contain a large percentage of the antiseptic oil. These requisites the following formula supply:—Oil of eucalyptus, six drachms; white wax, four drachms; cocoa butter, four drachms; mix and divide into twelve pessaries. One of these must be applied night and morning immediately after the usual sponging, and, though the napkins are frequently changed, the odour will be quite perceptible on the one removed prior to the next sponging twelve hours later. *In cases of miscarriage, or when the lochia has diminished materially in quantity*, say, six days after confinement, I have found the above strength produce irritation, and the following will then be found preferable: Oil of eucalyptus, four drachms; white wax, 160 gr.; cocoa butter, four drachms; divide this mixture into twelve pessaries, and label them No. 2. These also may be used at first night and morning, and afterwards at night only. They are made by first melting together the wax and cocoa butter in a vessel resting in hot water; the oil of eucalyptus is then mixed with this, and the fluid poured into the ordinary two-drachm pessary mould, each cavity being somewhat more than half-filled. (Dr. S. Sloan, p. 278.)

FISSURED NIPPLES.—Monti recommends that the nipples should be anointed with a (freshly made) solution of gutta-percha in chloroform, just enough of the latter being added to make the solution fluid. As it dries it forms a protecting pellicle, which does not come off even after suckling. (Practitioner, June, p. 459.)

LABOUR.—*Ergot.*—The liquid extract and the ammoniated tincture are the best, the latter especially, in obstetric practice. Ergotin is most convenient for subcutaneous injection. I have found the best results from the liquor secale ammo-

niata when well prepared. Let one typical case suffice : Mrs. M., in labour with her seventh child ; usually *very* quick. Visited patient at 8 o'clock in the morning. She had been in labour all night, during which time the membranes ruptured. Pains very feeble ; os dilatable and as large as the mouth of a teacup. Went home, returned about twelve and found her much in the same condition. I then gave liq. sec. ammon. (Ferris) 3 i. ; in thirty-five minutes sharp pains came on, and in other fifteen minutes the child was born. Placenta came away easily. In this case the labour had lasted eighteen hours. In cases where I have given 3 iss. of the secale for a dose violent uterine contractions have taken place, expelling the child and retaining the placenta for some time by hour-glass contractions. This retention of the placenta I have frequently found after giving large doses, but not with drachm or half-drachm doses. (Mr. John Dewar, p. 298.)

Dr. Evetsky states that beef-tea disguises the taste of the liquid extract of ergot almost entirely. (New York Medical Journal and Obst. Review, Jan.)

LACERATIONS OF THE CERVIX UTERI.—The cervix uteri is never found at the termination of the first stage of labour in a first case to dilate sufficiently wide to admit the head and body of the child to pass. It is, to all appearance, deficient in tissue to enable it so to do. Consequently on all such occasions with a full-sized child it is found to tear. The upper part of the vagina also frequently gives way, and still more frequently the lower. The perineal body is usually more or less lacerated, and often deeply and seriously so. The great bulk of these lacerations prove to be unimportant in themselves and transient in their results, but a certain proportion of them are serious and involve surgical interference to remove their evil effects, and for this purpose Emmet's operation is the best. In order to secure a good result the following rules should be observed : *Fixation of Cervix*.—To have the vaginal portion well under control during operation is a necessity of success. The cervix is exposed by Sims's speculum. The operation, if the uterus is fixed by adhesions, must be performed with the parts *in situ*. But if the uterus is free to move, much advantage is gained by depressing the cervix to the vulva, as there is then much more room for passing the needles. In either case the cervix needs to be fixed. This can be imperfectly done by hooks, but tolerably thoroughly by fixing a volsella in each lip, and either steadying the cervix or depressing the entire organ by pulling through them on the cervix. But hooks, and even volsellæ, readily loose their

hold or are pulled through. It is better to follow the suggestion of Dr. Jackson of Chicago, and pass a thick thread through each lip, and then, tying each thread long, to form thereby a strong loop in each lip, by which the cervix may be controlled and the entire uterus depressed if practicable. By pulling both threads at once the two lips can be accurately approximated, and by pulling with one loop in one direction and with the other in another the lips can be separated and held in any required position to facilitate paring the edges or passing or securing the sutures. A further improvement has been introduced by Dr. Goodell. This consists in using only one stout thread passed through both anterior and posterior lips, and then tied long so as to form a single loop. This thread is passed through the cervix in the mesial line of the body, and is thus a reliable guide at the end of the operation to where the external os should be, and in this respect is more trustworthy than the two loops. For the purpose of keeping the two lips apart the single loop is, if sufficiently long, as serviceable as two loops, since by pulling upon the part of the thread passing between the anterior and posterior lip the large single loop is easily converted into two smaller loops, which then can be manipulated singly. *Paring the Edges.*—The cervix being exposed and steadied as already explained, the patient being placed in the half-side half-face position, or in the lithotomy position, and chloroformed, the next step is to raw the edges of the wound. In so doing the superabundant tissues of the hypertrophied cervix are to be removed if necessary, so as to admit of perfect coaptation without unduly straining the parts in the grasp of the stitches. This is absolutely necessary to secure success, as if the stitches drag too much there is almost certain to be failure of the operation. The stitches and rawing must be so arranged as to secure as near as possible the normal condition of the cervix, consequently near the base of the cervix the rawed surface must be broad and the sutures deep, whilst near the apex its rawed surface is thin and the stitches introduced shallow. In this way the cavity of the cervix is restored nearly to its original condition, and no cavity is left for accumulation of mucus, which would be the case if we contented ourselves with merely securing adhesion of the surface of the rent only. It is surely not necessary to remark that the parts that are to form the cervical canal remain untouched. In rawing, care is needed where the tear abuts upon the vagina, *i. e.*, at the base of the rupture. Here the tissues removed must be as superficial as possible, in case we should have troublesome hemorrhage through wounding the cervical artery. The edges may be pared by knife or by

vaginal scissors. I prefer the latter usually, as less likely to be followed by bleeding, and also as more manageable as a rule. *Arrest of Hemorrhage.*—If the cervix is very much hypertrophied it is possible to apply some sort of tourniquet, such as Breisky's, round its base, and thereby secure a bloodless operation. But usually this is impracticable, and we endeavour to stop the bleeding by application of ice or of a jet of hot water. It is rare that a vessel needs to be tied. But it will be seldom necessary to wait for the complete arrest of the oozing from the rawed surface: it completely stops when the stitches are tightened. The necessary precaution must be taken at the moment of tightening the sutures, to clear out every particle of clot that may be situated between the edges of the wound. *Passing the Sutures.*—These are passed by means of short stout needles about $1\frac{1}{4}$ in. in length, and which are held in the grasp of a firm needle-holder. Each stitch should include, when tied, the entire depth of the rawed surface at that particular spot. Some trouble from want of room is experienced in passing the stitches when the operation is performed with the uterus *in situ*, but scarcely any if we can depress the organ sufficiently. *Securing the Threads.*—The two ends of each thread are now to be brought through a shield and secured by a twister. The twisted threads should be cut short, leaving only about half an inch or so, and then carefully bent by the aid of the needle-holder and a hook, so as to bring the twisted ends of the thread to lie parallel to the surface of the cervix, and thus not to wound the vagina. This is a most important arrangement, and is called by the Americans "kneeing" the sutures. *After-Treatment.*—The patient is put to bed and is kept scrupulously at rest for nine or ten days. She is not allowed to get up to make water or empty her bowels. But when you insist upon quiet, all that is required is done. The vagina is washed out with a disinfectant lotion once or twice daily, according to circumstances. The stitches are to be carefully removed about the tenth day. The patient should not be allowed to move about much for a week later. There is little pain experienced after the operation, and the patient, when lying in bed, feels quite comfortable. (Dr. Angus Macdonald, p. 269.)

PRURITUS VULVÆ.—Swab the parts twice weekly with solution of nitrate of silver (3 ss to ʒj), and give the patient a lotion for ordinary constant use containing two or three drachms of liquor carbonis detergens to a pint of water. A pill of reduced iron and strychnine twice or thrice daily (such as Kirby's Formula No. 85) will help the diabetic state. (Brit. Medical Journal, May 27, p. 803.)

SPONGE TENTS.—*New Method of Making Aseptic.*—Dr. Ernest Fraenkel, after briefly referring to the advantages possessed by sponge tents over tangle or tupelo tents, provided their greater tendency to sepsis could be obviated, draws attention to a method of rendering sponge aseptic proposed by Dr. A. H. Smith, Philadelphia. This consisted in first covering the sponge with a thin film of soap, and then rolling it in finely powdered salicylic acid. Instead of the salicylic acid the author proposes to use iodoform, which has proved very satisfactory in certain cases. He first rubs the tent with salicylic wool, and then rolls it about in coarsely powdered iodoform until the entire tent is thickly and equably covered with a layer of the iodoform. The tent is then introduced into the cervix, and the upper part of the vagina is carefully packed with iodoform gauze. In addition to these precautions, however, the author insists upon the most careful disinfection of the hands of the operator, all instruments, and other things used in the cases. (Edinburgh Med. Journal, Oct. p. 361.)

TRANSFUSION.—*A New Apparatus.*—Of the transfusors which have been at our service that of Dr. Aveling is, perhaps, all things considered, the most serviceable; but it has the disadvantage of requiring very complex manipulation. To put it concisely, each of them requires in its use for the surgeon to be aided by skilled assistance, whilst at the same time there is no safeguard against the injection of a minute quantity of air, however careful and adept the operator may be; an accident which, in all probability, would prove fatal to the patient. My instrument (see *woodcut*, p. 305) shows how these disadvantages are overcome. One hand alone is needed to operate the transfusor, and the other hand is at liberty to attend to the efferent tube; whilst the attention of the surgeon may be divided between the recipient and the donor of the blood. If any portion of air should at first remain adherent, and, of course, unseen, on the inner surfaces of the tubes, and, during the passage of the blood, be carried along with the stream, their course is with certainty arrested by the glass air receiver, into which they must rise. As to the *modus operandi*: The case contains the apparatus, knife, forceps, and a small bottle, which latter is intended to hold a compound powder composed, say, as follows: Carbonate of soda, ten grains; phosphate of soda, two grains; chloride of sodium, thirty grains. One-fourth of the powder should be dissolved in about two ounces and a half of water at a temperature of 100° F. A few drops of alcohol may be added, and the vessel containing the solution placed in

another vessel partly filled with water at a temperature somewhat higher. Then, having attached the receiving and delivering tubes, the two extremities of the instrument must be placed in the inner vessel with the air chamber downwards. Now press the lever, press the elastic ball, release the lever, release the elastic ball, and, after repeating that process once or twice, turn both taps. It is now ready for use. Raise the patient's arm to the horizontal position, so as to facilitate the transmission of the blood to the heart, and, having inserted both tubes, one into the supplying vein, and the other into the receiving vein—the right median basilic is, perhaps, the best—turn the taps, and, in the same order, press the lever, press the ball, release the lever, release the ball, and so on. Precisely one quarter of an ounce passes out each time. It is expedient, having commenced the transmission of blood, to complete the process without arrest, lest coagula should form. The apparatus is made by Messrs. Arnold and Sons, 35 and 36, West Smithfield, E.C., and their name is quite sufficient guarantee for excellence of workmanship. (Mr. J. F. Le Page, p. 305.)

MISCELLANEA.

ANÆSTHETICS.—When ether is to be given by *Clover's portable regulating inhaler*, two ounces of ether—this amount being equal to the contents of the small tin porringer placed in each box—will be found sufficient to commence with. For if the patient struggle, a larger amount will overflow and allow of the liquid ether to escape into the inhaling tube. After the lapse of ten to fifteen minutes the amount may be replenished by another half porringer full, and later on, if the operation be a long one, by another half porringer; but four ounces will generally be found sufficient for the longest operation. Ether of .720 sp. gr. is better than .735 as it combines better with chloroform and has less tendency to produce hyperæmia of the bronchial passages. Four parts of ether to one of chloroform is a very useful combination for *eye or rectal operations*, which require more profound anæsthesia. An improvised inhaler may be well contrived out of an inverted soda-water glass, in the bottom of which is placed a sponge covered by a napkin; the latter, coming over the rim of the glass, is folded backwards on the outside.—*Clover's gas and ether inhaler* (Mayer and Meltzer) has become now the favourite apparatus for the administration of anæsthetics in several of the London hospitals. Its mechanism is so constructed that it lies in the power of the administrator to give first nitrous-oxide gas alone, then a combination of gas and

ether, and finally ether alone. The advantage of quieting a patient preparatory to the giving of ether, by the administration of a few inspirations of nitrous-oxide gas is so very slight, that the usefulness of this inhaler is seriously counter-balanced by the increased cost of the instrument and its greater cumbersome-ness, compared with Clover's portable regulating inhaler.—Protoxide of nitrogen, or nitrous oxide, or laughing gas (Messrs. G. Barth and Co.), is used principally for *dental operations*, where the extraction of teeth and such operations of short duration can be performed within a few minutes, for a prolonged use of this anæsthetic is dangerous, and therefore not applicable to any operation of magnitude, or rather of long duration, the two being almost identical. Nitrous-oxide gas is given by Clover's combined inhaler. One minute is about the time occupied in producing insensibility with nitrous-oxide gas, or after three stertorous inspirations have taken place the patient will be found in a condition fit for operation.—Nitrous-oxide gas produces great congestion of the vessels of the face and head generally, shown by the lividity of the countenance, and also occasionally causes bleeding from the nose or even hæmoptysis. Therefore, in a case of severe *disease of the arterial system*, such being operated upon for ligature of a vessel for the cure of aneurism, I should not administer gas prior to the giving of ether.—In some patients *where anæsthetics have been taken badly* on a former occasion, small doses of ether and chloroform taken internally have been recommended with a view of getting the constitution accustomed to these drugs.—*To know when the patient is sufficiently under the influence of any anæsthetic* for the operation to commence, the conjunctival surface should be touched with the tip of the finger, and if no reflex action takes place, shown by the contraction of the orbicularis palpebrarum muscle, a sufficient degree of insensibility has been produced. The corneal surface of conjunctiva is more sensitive than that covering the sclerotic; therefore, if the latter shows insensibility when touched the anæsthesia will be found sufficient for ordinary purposes; insensibility of the former being, of course, required for operations upon the eye itself. It must be borne in mind, however, that the conjunctival surface repeatedly touched by the finger eventually loses its sensibility. This fact must be borne in mind by the chloroformist, and first one eye and then the other be touched, or a false impression that the patient is thoroughly anæsthetised may be conveyed. Paralysis affecting one side of the body may also occasion loss of sensibility of one conjunctival surface.—*Dilatation of the pupils* is a sign of the anæsthetic having been pushed to a suf-

ficient extent, and the inhaler should be immediately removed from the face.—*Flaccidity of the limbs* is no sign of cutaneous insensibility.—The use of chloroform is necessary for all operations upon the interior of the mouth (removal of tongue, &c.), for the same reasons as mentioned when speaking of cleft palate (see p. 312). When the mouth has to be kept open for some time, I frequently use Clover's chloroform bellows manufactured by Messrs. Coxeter and Son, whereby a mixture of chloroform and air is blown down the back of the throat.—The question whether anæsthetics should be given at all in *eye operations* is a debatable one, the vomiting from chloroform and the vascular turgescence from ether being the objections to their use. I consider that anæsthetics are always necessary for ophthalmic operations upon children, but never for adults, except in cases of enucleation and for operations upon the eyelids. (Mr. S. Osborn, p. 308.)

Relative Value of Ether when prepared with 'Rectified' or Methylated Spirits of Wine.—The subject of the safest drug with which to produce anæsthesia has been sufficiently discussed, and the verdict of those best able to judge has been given, out and out, in favour of ether, as against chloroform, when "properly administered by a skilled etherist." There are, however, two samples of ether in the market, to the relative value of which, I believe, the profession is not fully alive. The two forms of 'spirits of wine' used in the manufacture of ether create in reality two kinds of ether, and the differences between them are important. Firstly, the ether prepared from rectified spirit is found less desirable as an anæsthetic by those who have used it, and it is not considered as safe, producing more sickness and laryngeal spasm in certain cases in which there is a tendency to such complications. Secondly, it is about twice the cost; for instance, the methylated ether costs 2½d. per ounce, and the rectified ether costs 4½d. per ounce. I have not used the rectified ether in my own work, so cannot speak of individual experience of its actions. But of the use and applicability of the methylated ether as the safest anæsthetic known, when carefully administered by means of Clover's inhaler—I can speak strongly as the result of my daily observation. It is a very ordinary circumstance to occupy eighty seconds in producing complete anæsthesia, without a struggle or a cough, and it is by no means extraordinary for a patient to be 'fully under' *within* the minute. In the case of short operations on the eyes, and the like, it is hardly ever necessary to reapply the inhaler after it has been once removed for the operator to commence, the patient remaining sufficiently anæsthetic for

an operation such as I have mentioned to be completed without hurry. Anæsthesia can be prolonged with equal safety; even so far as to keep a patient in labour completely under its influence for upwards of *four hours*; the longest time which has happened in my experience. Methylated ether is, I consider, from this point of view, the safest and cheapest anæsthetic at present in use. (Mr. H. Bendelack Hewetson, *Lancet*, July 1, p. 1072.)

The Administration of Chloroform.—The *Gazette des Hôpitaux*, at the end of the *résumé* of a prolonged discussion on this subject, at the Académie de Médecine, gives the following rules of procedure observed by a *collaborateur* who has been much employed, with constant success, in the administration of chloroform during the last ten years:—1. The compress is to be preferred to all other means; a handkerchief is to be had everywhere, and alarms the patient less than anything else. 2. Fold the handkerchief into the form of the mouth of a horn, and keep it closely pressed against the point of the nose; but only pour the chloroform on the part of it which is not directly in contact with the skin. 3. Its application should be intermitted, but this need not be done in the precisely regulated manner recommended by Prof. Gosselin. 4. Give very little chloroform at the commencement, in order to accustom the patient to it and prepare him for the feeling of suffocation. Then, when the first inspirations are over, pour on the chloroform very often, otherwise much time will be lost and complete anæsthesia obtained only with difficulty. 5. Before commencing the application take care that no article of dress constricts the patient, removing even the string of a cap. 6. Expose the epigastrium, and from the very commencement keep the eye on it and *constantly* watch the respiration without caring about the pulse. 7. Always have a forceps within reach. 8. As soon as the respiration becomes noisy and stertorous, remove the compress and allow the patient to breathe fresh air for a time. 9. When respiration is arrested, seize the tongue with the forceps and draw it out, and immediately commence artificial respiration. If the respiration is not re-established after a few seconds, place the head low, forcibly flagellate the cheeks, keep the tongue out, and continue the artificial respiration for five, ten, fifteen, or even twenty minutes, if necessary. 10. When the respiration is noisy, pass into the back of the throat a sponge mounted on a forceps, in order to remove the mucosities existing there—as they frequently do in patients suffering from colds. 11. There is but one contra-indication to the employment of chloroform, viz., advanced phthisis. Affec-

tions of the heart are not contra-indications. 12. Hysterical subjects should be distrusted. 13. Alcoholic subjects are very tedious and difficult to bring under the influence of chloroform, but they are not dangerous. (Practitioner, Sept., p. 214.)

Morphia as an Adjuvant to Chloroform.—An interesting paper "On the Combined Use of Morphia and Chloroform in producing and maintaining Surgical Anæsthesia," by Dr. Alexander Crombie, Superintendent of the Medical School, Dacca, Bengal, was published in the Practitioner in 1881. (See *Retrospect*, vol. 83, p. 296.) This paper does not appear to have attracted the notice it deserved, both on account of its originality and the remarkable results obtained by the method described by the author. Dr. Crombie states as the result of his personal experience that out of about 600 cases in only one was there threatened asphyxia, "and in that instance the usual precautions had been neglected." The method employed is very simple, and consists in the hypodermic injection of morphia immediately after beginning the administration of chloroform. I have recently employed a modification of this plan with the greatest comfort to the patient and to myself. About ten minutes before administering the chloroform I inject a full dose of the liq. morphiæ hypod. B. P. The chloroform is freely sprinkled on a piece of lint folded twice, and one dose is as a rule sufficient to induce complete anæsthesia. Having a day or two ago to open a large abscess of the thigh, in the case of a lady who has been an invalid for the last ten or twelve months, I induced anæsthesia easily and rapidly in this way. The patient, who has repeatedly had chloroform administered for confinements, tooth extraction, &c., assured me that she had never before taken it with such a total absence of all feeling of discomfort. There was no sensation of suffocation and no trouble with after-sickness, which had on previous occasions proved troublesome. (Dr. Andrew S. Currie, Lancet, June 24, p. 1031.)

CHLOROFORM-WATER.—In the Gazette des Hôpitaux, attention is drawn to this highly useful preparation of chloroform for internal use. Professors Laségue and Regnaud have shown that the solubility of chloroform in water does not exceed 9 per 1,000. The solution is obtained by pouring an excess of chloroform into a bottle three parts full of distilled water, shaking the mixture repeatedly, and then allowing the insoluble chloroform to deposit until complete transparency is obtained. The separation of the saturated solution is then made by decantation, or by means of a syphon. This

solution, being too strong for internal use, requires dilution. (The *Aqua chloroformi* of the British Pharmacopœia has a nominal strength of 1 in 200.) Various salts (as chlorate of potash, borate, bicarbonate, and salicylate of soda) may be dissolved in this water without undergoing any modification; and Professors Laségue and Regnauld are of opinion that chloroform-water, either pure or diluted, will meet every need in the internal administration of this substance. Having a pleasant taste in the mouth which lasts for a minute or two, it is well calculated to disguise the unpleasant taste of various medicines, as castor-oil, &c. By the direct action which it exerts on the mucous membranes, it may prove useful in certain affections of the mouth, gums, teeth, velum, and pharynx. It exerts a stimulant action on the stomach, but it acts differently according as it is taken before, during, or after a meal, and according to the lapse of time that has intervened between taking the meal and the absorption of the chloroform. Given before a repast, in aid of the appetite, the chloroform-water is a bad agent; but given after a meal, whether alone or combined with an alcoholic wine and sweetened, it increases the stimulant properties of the wine or produces like effects. When administered to allay the manifold troubles which supervene during the course of digestion and produce its disturbance it has much value. Its maximum therapeutic action is obtained three or four hours after the meal, when functional disturbances show themselves by yawning, distension, gaseous eructations, a sense of epigastric pressure or heaviness, flushings of the face, and threatenings of vertigo. But when the digestive disturbances are manifested by acute lancinating pains of the stomach, oppression, palpitations of the heart, fleeting febrile action, dryness of the mouth, painful tympanites, &c., the action of the chloroform-water is injurious; this stage contraindicates all forms of stimulants. In a word, the chloroform-water acts on the stomach in the same calming way as upon the interior of the mouth, and if it does not cure the affection, at least it mitigates its consequences. It is a remedy for the crisis, but does not render needless the proper treatment-in-chief. It is eminently suitable in painful digestion arising from dilatation of the stomach. (Professors Laségue and Regnauld, Practitioner, Sept., p. 215.)

EMBALMING BODIES, AND THE PRESERVATION OF TISSUES.—
Dr. Virodtxeff recommends the following preparation as an efficient agent in the embalming of bodies and the preservation of tissues:—Thymol, 5 parts; alcohol, 45 parts; glycer-

ine, 2,160 parts; water, 1,081 parts. It is cheap, innocuous, free from unpleasant odour, possesses the property of keeping the body soft, elastic, fresh, and life-like, and does not ruin instruments. Thymol is selected as being superior to other antiseptics, and glycerine is added, both on account of its own preservative qualities and to retard the evaporation of the fluid. For the preparation of tissues the same solution is employed. If the cadaver be quite lean, or the tissues very delicate, equal parts of water and glycerine (1,620 of each) are combined with the above quantities of thymol and alcohol. To inject a body, half its weight of the fluid is necessary. A properly embalmed cadaver may be preserved indefinitely under ordinary circumstances, gradually shrinking and mummifying without putrefaction. Specimens are either to be injected with or macerated in this fluid. Maceration must not be too prolonged—the appearance of the specimen should act as a guide. The part, after having been thoroughly cleansed with water and prepared, may then be exposed for months to the air without losing its consistency, form, and colour. Permanent specimens may be enclosed in a hermetically sealed glass vessel containing a little of the same solution. Dr. Peabody has used this preserving fluid with excellent results in the New York Hospital Museum. (Dublin Journal of Med. Science, June, p. 502.)

HYPODERMIC INJECTIONS.—MORPHIA.—The following is the formula of a perfectly stable preparation which never shows signs of change, or of the growth of fungi, after keeping even for years; and never gives rise to inflammation, or even to irritation, when administered as he describes: R. Morph. sulph. gr. xcvj; aq. destill. ebull. ℥iij; acid. sulph. dil. ℥viij; Misce et adde acid. carbol. gr. xx; glycerin. pur. ℥j. Cola per chartam. Of this twenty minims contain one grain, and the only objection to this solution is that it might be confounded with Magendie's somewhat weaker solution; but this may be obviated by diluting the one to the strength of the other. A solution also that will keep well at least for months is made by adding carbolic acid to Magendie's solution. Dr. Ainsworth, however, in the exigencies of military practice in remote districts, has often been compelled to use old solutions full of vegetable growths; and he attributes the fact of their not having produced cellulitis or abscess to his method of administering the injection. Taking good care not to allow any of the solution to escape into the subcutaneous cellular tissue, the needle of the charged syringe is plunged *deeply* into the substance of a muscle, the piston gently pressed home, and the needle

withdrawn. The thick muscles of the thigh, the gluteal region, or the back, may be made the site of the injection; but owing to its accessibility, the deltoid is in general to be preferred. The subcutaneous cellular tissue is very easily inflamed in certain conditions of the system, and Dr. Ainsworth believes that with whatever precaution the operation be performed in the ordinary way, an abscess is apt to follow. On the other hand, muscles are slow to inflame and suppurate, and a few minims of solution can be readily and rapidly forced into their substance with but little pain, when a needle of sufficient length is used and the skin is kept tight over the site of the puncture. (Dr. Ainsworth, U.S., Practitioner, May, p. 372.)

New Safety Hypodermic Injector.—In view of the frequent employment now made of hypodermic medication, and the costliness and trouble of the syringe generally used for the purpose, Dr. Ward Cousins, Surgeon to the Royal Portsmouth Hospital, has introduced a cheaper and simpler instrument. It consists of an elastic measuring ball and an injecting needle; a boss on the latter serves for a handle in its introduction; the needle may be either fixed to the ball or jointed at the boss. The balls are made in various sizes, holding from one to twenty minims, so that if the right ball be selected an accidental overdose of the drug administered is impossible. The ball is charged by compressing the ball and allowing it to expand, while the point of the needle is immersed in the fluid to be injected. Dr. Cousins urges that a separate instrument should be used for every drug, and also for every patient. We doubt whether this 'safety' injector will replace the syringe now in use; but in cases where it may be considered necessary to leave the administration of hypodermic injections to nurses or patients' friends, this injector will be found a great improvement upon the syringe. The apparatus is made by Messrs. Lynch and Co., of Aldersgate Street. (Lancet, Aug. 26, p. 315.)

IODOFORM.—Poisonous Effects of.—Iodoform has, during the last few years, been very extensively employed as a local application to soft chancres, sluggish ulcers, strumous joints, and burns, but until quite recently the surgeons so using it have had no suspicion that it might give rise to serious constitutional disturbance, and that in some cases even a fatal issue might ensue where its external application was long continued, or where the surface to which it was applied was capable of rapid absorption. On a free surface where a great deal of the iodoform is carried into or through the dressing by

the discharge, the risk of absorption will be less than in a sinus with only one external opening where the discharge is pent up and the iodoform may be retained for many days. Nor must it be forgotten that some granulating surfaces are more active than others in absorbing materials from without, healing burns being especially adapted for absorption, which may account for the number of fatalities where this drug has been employed in the treatment of burns. These considerations do not, however, account for all the cases of iodoform poisoning, nor can the plausible suggestion of a writer in the *Brit. Med. Jour.*, that the action is cumulative, and that poisonous effects are only produced after long treatment, be entertained in view of the facts detailed as to the case under our observation. We are driven, indeed, however reluctantly, to the position held by Schede, that there is a peculiar idiosyncrasy rendering certain persons liable to constitutional effects from the local use of iodoform, and that it is therefore necessary in all instances where it is used to carefully watch its effects, and cease its use whenever there is a distinct rise of temperature. (Mr. Henry E. Clark, p. 313.)

Solvents of Iodoform.—According to Vulpius, the most agreeable form of applying iodoform externally is its solution in colloidion which may be made of any strength up to 15 per cent. Absolute alcohol and oil of turpentine dissolve 4 per cent., oil of lavender 7, and oil of caraway 16 per cent. Other essential oils have a solvent power varying between these limits, and apparently connected with the proportion of oxygen each oil contains. Olive oil takes up 20 per cent. when hot, and retains 2 per cent. on cooling. (*Pharm. Journ. and Trans.*, April 8.)

NEW AND CHEAP DISINFECTANT.—The following is given in the *Progress of Science*:—Dissolve half a drachm of nitrate of lead in a pint of boiling water; also two drachms of common salt in a bucket of water; pour the two solutions together; allow the sediment to precipitate, and the clear supernatant fluid will be a chloride of lead. This will deodorise and disinfect sinks, water-closets, or drains, and a cloth dipped into it will sweeten a foetid atmosphere. (*Dublin Journal of Med. Science*, May, p. 417.)

NEW MATERIAL FOR CASTS AND MODELS.—I recently exhibited at the Museum of the British Medical Association at Worcester some casts, made of a new material, and, as numerous inquiries have been made as to their composition, I trust that the following brief account of the method of manufacture, and of the materials used, may be of use. The latter are as

follows: Swinburne's prepared gelatine, 8 oz.; French chalk, 14 oz.; honey, 26 fl. oz.; glycerine, 6 fl. oz.: that is, the proportion of 1 part gelatine, $1\frac{3}{4}$ French chalk, $3\frac{1}{4}$ honey, $\frac{3}{4}$ glycerine. Prepare a colouring solution: rub down half a drachm of carmine in half-an-ounce of water; to this add two and a half ounces of glycerine, and keep in a stoppered bottle; shake the mixture before use. The French chalk should be perfectly white, and the honey of as light a colour as possible. ("Furber's Strained Californian Honey" and "Narbonne Honey" are the best.) The cost of these materials will be about 7s. The implements required are two large china pudding dishes, and two saucepans large enough to contain the same. Put all the gelatine into one of the dishes, and add plenty of cold water. Leave it to soak exactly half an hour. While the gelatine is soaking, weigh out the French chalk into the other dish, and add the glycerine. Stand the pots containing the honey in some hot water till it is fluid enough to pour; then add it to the mixture of chalk and glycerine. Mix all well together, and place the dish containing the mixture in a saucepan of boiling water; let it get nearly to boiling heat, and keep on stirring it gently. To this mixture must now be added the colouring solution, sixty minims of which will make a good flesh colour. When the gelatine has finished soaking, turn it out into a clean cloth, and wring out every drop of superfluous water; put it back in the dish, and place the latter in a saucepan of boiling water, over a fire or gas jet. As soon as the gelatine begins to dissolve round the edges of the dish, pour over it all the hot mixture of French chalk, &c., and keep on stirring for fifteen or twenty minutes over the fire till the whole is thoroughly homogeneous; then remove the dish, allow the liquid to cool to about the consistency of treacle, and pour it into the mould. It is better not to use the freshly prepared material for casts, but to pour it out into flat dishes, and, after it has set, keep it for a week or two before using, when it may be readily melted by putting the dish containing it into a pan of boiling water. Should the material have been kept very long, it may be necessary to add a very little water to facilitate the melting. Considering that it takes some time to set at the temperature of the body, it is not advisable to use the material for taking the mould, for plaster-of-Paris is in every way better. Moulds made of the latter material should be well dried and oiled, after which they should be painted with spirit varnish, and again oiled before use. The cost of the material is slight, and the time occupied in making a considerable quantity is about one hour or rather more. Casts thus prepared present a very great resemblance

to human flesh, both in colour, texture, and translucency. They are very easily painted, and form an admirable groundwork for the depiction of skin diseases. As to their durability, I cannot speak with certainty, having none which have been made more than ten months. It is very necessary to keep them in a dry place. I shall be glad to show specimens to anyone who will call on me at St. Bartholomew's Hospital, and to supply any additional information. (Mr. Anthony Bowlby, East Dereham, British Medical Journal, Oct. 21, p. 783.)

NEW VESICATORY.—Dr. Armengué, of Barcelona, has been recently experimenting with a new vesicatory, derived from a beetle (*Enas afer*), found in great abundance in some provinces of Spain. As the result of the experiments, which he has tried upon himself and some medical students, he has come to the conclusion that this blistering agent is more certain, more prompt, less painful, and less costly, than the one derived from the cantharis. It does not seem, moreover, to induce irritation of the genito-urinary organs. (Med. Times and Gazette, June 10, p. 606.)

NURSERY MILK.—I should like to direct the attention of practitioners to the *Artificial Human Milk* now prepared by the Aylesbury Dairy Company, at a cost little over that of the best nursery milk. This valuable method of treating cow's milk was first brought under my notice, some years ago, by Dr. Frankland, the eminent chemist, who devised it for one of his own children who was ill; and I have since used it extensively in my practice. Its composition is absolutely identical with that of human milk; and under its use the risks and disadvantages of the bottle-feeding of infants are reduced to a minimum. I have been in the habit of instructing nurses how to prepare it at home from Dr. Frankland's recipe, but the trouble and difficulty of making it stood seriously in the way of its general adoption; and, unless the nurse happened to be exceptionally intelligent, failure very frequently followed. For this reason, I suggested its manufacture to the Aylesbury Dairy Company, and the specimens with which they have since supplied me have been perfectly satisfactory, and require no further treatment than heating to the proper temperature. I look upon it as immeasurably superior to asses' milk, than which it is much cheaper; and if this valuable preparation were more generally known and used, much illness, in the case of children who cannot be brought up at the breast, would be avoided. (Dr. W. S. Playfair, British Medical Journal.)

OOLACHAN OIL AS A SUBSTITUTE FOR COD-LIVER OIL.—Not long ago dugong oil was introduced into this country as a rival to cod-liver oil, and now a new claimant has appeared under the name of 'oolachan oil.' At ordinary temperatures it appears to have a consistence between that of dugong and cod-liver oils, and a taste that is perhaps slightly more agreeable than either. The oolachan fish is about the size of a herring, and is met with on the coasts of British Columbia and Vancouver's Island. It is so full of oil as to be known as the candle fish, for when dried, it can be used as a torch. (Edinburgh Med. Journal, June, p. 1125.)

READY METHOD FOR HOT FOMENTATIONS.—The flannels are merely placed in the steamer of an ordinary potato steam-kettle; they quickly become thoroughly permeated by the steam, when the kettle is placed on the fire, and can be readily changed without any fear of scalded fingers during the attempt to wring them sufficiently dry, as in the ordinary method. (Dr. R. Neale, British Medical Journal.)

VACCINATOR.—*New Form of.*—Messrs. Ferris and Co. of Bristol, have forwarded an ingenious form of vaccinator, mounted in the shape of a pencil-case. At one end, there are five needle-points, covered by a silver perforated cap, which moves up and down on a stud, so as to expose the needle-points; or, when not in use, they can be wholly covered, by a slight bayonet-like arrangement of the cap. At the other end, there is a reversible silver spatula for collecting lymph, and rubbing it upon the superficially lacerated cuticle. The advantages of this instrument are its ready portability, its perfect cleanliness, and the absence of all sign of cutting arrangements, the presence of which tend so much to alarm timid mothers and children. After use, the needle-points can be readily cleaned by passing them through some soft wash-leather. (Brit. Med. Journal, Oct. 14, p. 742.)



PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

ART. 1.—ON THE ACTIVE PRINCIPLE OF MALARIA.

By the EDITOR of THE LANCET.

The search for a contagium vivum as the active principle of malaria and the efficient cause of paludal diseases has engaged the attention of many investigators, and appears at last to be near a successful issue. The points of similarity between intermittent and remittent fever, and the discovery that the paroxysm of the latter is attended with, and apparently caused by, the presence of organisms in the blood, naturally lead to the assumption that the paroxysms of ague may have a similar pathology. As long ago as 1874 Klebs and Tommassi-Crudelli collected sporule-forming bacilli in the air of malarial regions, and succeeded in cultivating them, and their injection into rabbits produced febrile attacks, which the experimenters compared with intermittent fever. Much more important investigations have, however, lately been made by Cuboni and Marchiafava, on the blood of patients suffering from the disease. They constantly found spherical mobile micro-organisms in variable number, and always in the interior of the white corpuscles. At the commencement of a febrile paroxysm small bacilli were seen bearing a spore at each end; their length was from one to three times the diameter of a red blood-globule. During the progress of the attack these bacilli lessened in number, while free spores became more abundant. The presence of these organisms in the blood during the apyretic stage of the disease lessens the significance of the observation, at any rate if we are to be guided by the analogy of relapsing fever. Moreover, an Italian observer, Lanze, failed to find these organisms in twelve cases in which he searched for them during the cold stage, but in one instance he found them abundantly during a severe rigor. They were also present in a case examined by Peroncito. A very interesting observation has also been lately published by Professor Marchand, of Giessen, and was made, indeed, before the announcement of the observations to which we have referred. In blood taken during an attack there were seen some small refracting corpuscles, which presented an active movement, although it is doubtful whether

this was anything more than ordinary molecular oscillation. Many small organisms, however, were seen, consisting of two adherent corpuscles. There were also a few long rod-shaped bodies with swollen ends. They presented very distinct movements of their own.

Much more remarkable, however, and, if trustworthy, much more important, are some observations which have been made in France. The first of these, those of Laveran, were described in our columns a few months ago (*Lancet*, Nov. 12, 1881, p. 840.) A series of observations has just been published by Richard which entirely confirms and extends those of Laveran. It will be remembered that the latter described a peculiar organism, of very remarkable characters, as invariably present in the blood of patients suffering from the disease. The organism was rendered motionless and apparently killed by a dilute solution of quinine, a fact which seems to afford an adequate explanation of the utility of quinine in malarial diseases.

The researches of Richard have been carried on at Philipville, where malarial fevers abound. He has found the parasite described by Laveran to be invariably present in the blood of these patients, and has never seen it in that of persons suffering from other diseases. The observations which he has made on the life-history of the organism and its relation to the malady are in several points new. The organism has a special habitat, the red corpuscle of the blood, in which it develops, and which it leaves when it has arrived at a perfect stage of development. During the attack of fever many blood-globules are seen which possess a small perfectly round spot, but they have otherwise the normal appearance and possess the normal elasticity. In other corpuscles the evolution of the parasite is farther advanced; the clear spot is enlarged, and is encircled by small, black granules, while around it the hæmoglobin, recognisable by its greenish-yellow tint, forms a ring, which becomes narrower and narrower as the parasite increases in size. Ultimately this substance of the corpuscle is reduced to a narrow, decolorised zone, from which the hæmoglobin has disappeared. The appearance is then that of a circular element, having nearly the dimensions of a red globule, and containing an elegant "collarette" of black granulations, which is, in effect, the organism arrived at maturity. It is provided with one or two delicate prolongations. The parasite then pierces the membrane which contains it, and escapes into the blood plasma. In several of his preparations Richard has actually seen the organism escape from the investment, which remained attached to it, on one side, as an extremely delicate circle. In other cases, the mobile filaments alone pierced the capsule, within which the body of the organism remained enclosed. In both

cases the filament begins to move, lashing the adjacent red globules. Sometimes the recurved extremity of the filament becomes entangled in a network of fibrin, and then the movement of the filament causes the body of the parasite to oscillate. At the end of an hour, sometimes less but rarely more, the movement ceases, and apparently the life of the parasite. These curious movements are to be observed in only a few of the parasites at any given examination, since only a small number are in a sufficiently advanced stage of development. In the ultimate condition of many of the infected corpuscles the pigmentary collarette is absent, and there is merely a greyish mass, containing a few black granulations, which have been noted by Kelsch, and some other observers. These pigment-granules become free, and are rapidly broken up by the leucocytes which become impregnated with them. Hence the melanotic leucocyte, which has often been observed in malaria, is, so to speak, only an epi-phenomenon of the palustral process, the primordial and essential change being that in the red corpuscle. Laveran has observed the presence of other elongated bodies, oval or crescentic, having a length about equal to the diameter of a red corpuscle. Richard has also often observed these objects, especially in the blood of old subjects of the disease; he believes that they are infected red globules, which have been detained for a long time in the capillaries, which they traverse with difficulty, and which have thus become permanently deformed. He is also inclined to believe that the parasites in these have become arrested in their development, since these objects never present active movements.

These observations afford abundant scope for speculation regarding the mechanism by which the symptoms of malarial poisoning arise. Richard, for example, suggests that the comatose condition sometimes observed during attacks of endemic fever may be due to the obstruction of cerebral capillaries by masses in which the granular collarettes indicate the presence of these special organisms. The infected red corpuscles present conspicuous evidence of having lost their elasticity and become viscous. If the cover glass is pressed the normal corpuscles are displaced in all directions, while the diseased elements remain fixed and can only be moved by much greater pressure. This change must interfere very much with their passage through the finer capillaries, and the number of infected globules is so enormous during the attacks of fever that the total obstruction to the circulation from this cause may well be considerable. Many other phenomena of the disease—the remarkable anæmia, the action of quinine, and the persistence of the infection—are all perfectly explained by these facts. The same organism was

found in every case examined, with the exception of some individuals suffering from the persistent malarial cachexia, the consequence rather than the manifestation of the paludal poison.—*Lancet*, June 17, 1882, p. 993.

2.—THE ETIOLOGY OF THE ACUTE SPECIFIC DISEASES.

By KENNETH W. MILLICAN, B.A., M.R.C.S., L.R.C.P.Ed.,
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Probably the most important, as it is certainly one of the most interesting, problems which Public Medicine proposes to us for solution, is to be found in the inquiry concerning the etiology of the acute specific infectious diseases. Their rapidity of propagation, their dangerous sequelæ, and their large fatality, all render them objects of special attention to the sanitary worker. The past few years have seen great advances in our knowledge of them; but though many theories have been advanced, and much dogmatically asserted respecting them, there is still much that is obscure.

Probably the greatest advance that has been made, is the attempt to connect them with the growth and development of living organisms, constituting what is known as the “germ-theory” of disease. Although speculation had, for some years, directed itself towards this field of thought, the first important practical application of it may be safely claimed for the system of antiseptic surgery, now inseparably linked to the name of Lister. It is in the region of surgery rather than in that of medicine, that visible and tangible results of therapeutic methods may be expected; and the brilliant results of “antiseptic surgery” soon cleared the way for a general acceptance of the “germ-theory,” as applied to disease. It is now, perhaps, scarcely too much to claim that this doctrine numbers among its adherents by far the larger proportion of the medical profession; and the brilliant and invaluable researches of Koch, Klebs, Pasteur, and a host of others, are now matters of ordinary medical teaching.

It is especially in reference to the part played by this important doctrine in our speculations on the etiology of disease, that I wish to lay before you a few observations. The investigations of sanitary observers in rural districts have been slowly accumulating, in recent years, a mass of affirmative evidence in answer to the important question—“Can all, or any, of the acute specific infectious diseases originate *de novo*?” I have alluded particularly to rural districts, because it is there, if anywhere, that observation can be relied on, and sources of fallacy can be best eliminated. In towns, where people are crowded together, where each individual comes into constant

daily contact with numbers of others of whom he knows nothing, the negative evidence arising from inability to trace any source of infection is but of little value. The using of an infected cab, the receiving of a handbill in the street, the purchase of goods at a shop, the crush at the ticket-office of a railway station—all are matters of such constant occurrence as to be beyond notice; and yet any one of these factors may suffice, given the requisite conditions, to convey an infectious disease.

But, in remote country districts, people are much more isolated. Weeks often pass without one's meeting a stranger. The illnesses and troubles of every neighbour for many miles round are well known to all; and the contact, direct and indirect, with the outer world is so comparatively small, as to be easily recalled to memory.

There are, too, homesteads in the country where, from year's end to year's end, the inmates never see a stranger. Isolated homes, miles away from any dwelling, where all and every kind of intercourse or exposure to infection might be easily traced. It is when infectious diseases break out in homesteads such as these, that the sanitary student has opportunities for investigating fully the possible sources of infection; and it is from cases such as these that there has been accumulating among rural medical men—especially officers of health—evidence of what one cannot but regard as *de novo* outbreaks of infectious disease.

It may be as well, perhaps, to consider here to what diseases we are going to refer. The principal infectious diseases met with in this country admit of division into two great groups as follows: 1. Typhoid, typhus; 2. Measles, scarlet fever, small-pox. Between these two groups, and acting in some sort as connecting links, lie diphtheria, diarrhoea, rötheln, and erysipelas.

Now, with reference to this question of *de novo* origin, there are many who, while they contend most strenuously for the absolute and unconditional specificity of the second group, are prepared to admit a possible *de novo* origin of the first group and intermediate diseases. Others, again, refuse that property to the first group also, but concede it to the intermediate class; while some contend still further for the specific nature of rötheln and diphtheria; but there are very few who are prepared to consider scarlet fever and measles as possibly self-originating, and still fewer who would think of including small-pox.

Personally, however, I feel bound to conclude that all or any one of these may originate spontaneously; and that, having so originated, it is capable of transmitting its like by infection.

And more than this : I must confess my belief that it is within the bounds of possibility for one form of so-called specific disease to give rise to another form—as for instance, scarlet fever to diphtheria, or *vice versa* ; and I will now endeavour to state, at the same time briefly and clearly, the grounds upon which I found this opinion.

In the first place, there is the argument on general grounds that, as these specific diseases must have originated before, so they may originate again. To this it is replied that, if that argument be sound, then it must be equally true of the whole animal and vegetable kingdom, which it obviously is not ; as a re-development of a horse or a cat, for instance, in the animal, or an oak or a rose in the vegetable world, is a thing unknown so far back as the history of man can reach.

The answer to this objection is, in my mind, both simple and complete. The higher the position in the scale of life occupied by any organism, the longer is the period required for its transformation, and the more complex are the conditions of its existence. A variation, not of sufficient definiteness and character to be permanent, may be frequently spontaneously originated, because the conditions required therefor are far less complex. Hence, by the same process of varying the conditions of existence, the cultivator may reproduce an already existing variation of plant or animal. But the development of a species, though it may occur once, is, by the very complexity of its conditions of transformation, almost prohibited from ever occurring again.

This is the case among the higher members of both animal and vegetable kingdoms ; but in their lowest forms the case is different. There, the conditions of existence are necessarily few and simple, whence it may be inferred that the conditions requisite to produce a specific or permanent variation are few and simple likewise, and so more likely to concur. There is, therefore, much greater probability of lowly constituted organisms of this character finding themselves placed under conditions in all respects similar to those which determined the origin of a species in bygone times, and thus, by adjustment to their environment, once more developing into an already existent species. The probability of this event appears to me to be in direct proportion to the length of time occupied by the life-history of the organism ; or, even if that be not strictly the case, at least we must confess that that consideration is one which brings the process of evolution within the range of human observation. We are surely more likely to be able to trace the process of development which would ensue under a varied environment in the *Bovista gigantea*, whose cells multiply, according to Professor Lindley, at the rate of sixty-six millions

per minute, than in the case of highly developed plants which occupy a very considerable portion of time in their growth and development. The same remark will apply equally to bacterioid organisms as compared with the higher classes of animals or vegetables.

But, to come to more special arguments, it appears to me that attention has been hitherto too much concentrated upon known and recognised types of the various zymotic diseases ; whereas it is from careful and accurately recorded observations of the more abnormal cases that I conceive most light will be thrown on this problem. These abnormal cases may be principally classed under the three following heads, viz. :

1. Cases where disease of one type appears to reproduce disease of another type ;
2. Cases where, from a common source, two or more distinct diseases appear to take their origin ;
3. Cases of indeterminate type, and such as present gradations.

Now, there are numberless instances of each of these three classes on record. Time is too short to enumerate them at any length ; but, with regard to each class, I will just refer to one typical case.

Dr. Holland, assistant-physician to the Hospital for Women, reported in the *British Medical Journal*, Feb. 1, 1879, a case where two girls, who suffered from habitual rhinorrhœa, having left a school which had dispersed in consequence of scarlatina, and after staying a week at home, entered a fresh school. In a week, an epidemic ran through the school, the patients presenting "every conceivable variety of diphtheria and of scarlatina, with and without rash." Moreover, two of Dr. Holland's children took the infection home ; the eldest, who had previously had scarlatina, resisted well ; the two youngest had malignant diphtheria.

Of the second class, so many examples come to mind, that it is difficult to select ; but I think that in referring to a case which occurred in my practice two years ago (the details of which were published in the *Lancet* of March 18th in this year), I shall save time, as this will also serve as an example of class 3. Briefly, the case was this. A young labouring man was attacked with typical severe typhoid fever. Presently diphtheritic patches formed on the tonsils and pharynx ; on the twelfth day of the fever, abdominal rose spots appeared. At the same time, a rash, of distinct typhus character appeared on the pectoral regions. The temperature rose to 105° Fahr., but fell three days after to 100° Fahr., when a crop of papulæ appeared on the buttocks and wrists. These became vesicular, and finally pustular, the fever again appearing at the period of suppura-

tion. The cause of this attack was most exhaustively investigated, not only by myself, but by Dr. Wilson, the medical officer of health, but no cause of a specific character of any kind could be ascertained. The only causes were the ordinary unsanitary conditions.

The calling of such cases as these "simulated" disease, appears to me to be a *petitio principii*. The contention is, that certain diseases can originate *de novo*. And when, in support of this contention, cases are brought forward tending to bear it out, it is objected that they are only "simulated" diseases, because they have not the essential element of production from infection.

It appears to me that, in the doctrines of development and origin of species lies the clue to the mystery; given life, if the conditions which determine a certain line of development coexist at different times, why should not the same line of development recur? The disease known as scarlet fever, if due to a specific germ, as there is every reason to believe it is—and as has been shown almost certainly to be the case in relapsing fever and other diseases—may be developed afresh, if the same series of conditions coexist as were efficient in the origin of the scarlet-fever germ. And, in the consideration of these conditions, I feel justified in asserting that more prominence will, in future, have to be assigned to the individual in whom the disease appears. For the act of poisoning to occur, there must be not only the poison, but a person apt to be poisoned.

In short, while a great deal has been attributed to the specific nature of the germ, the specific nature of its *pabulum* has not yet received due attention. In the first development of the specific scarlet fever germ, the adjustment of the organism to its environment played no unimportant part. The process of development is surely going on now in all respects; but, while in all the higher organisms with an extended life-history it is so slow as to be beyond the reach of our observation, it is just in these lowest forms of life that we should expect to find it perceptible, if at all. It is not very many years ago in the history of medicine since we learned the distinction between typhus and typhoid fevers, between scarlatina and measles. That may have been the result of insufficient or inaccurate observation; but it may also have been the result of the fact that these diseases were then only in process of development.

Be this as it may, it appears to me to be a fairly logical and scientific hypothesis, and one not devoid of evidence in its favour, that germs possessed of no specific disease character may, on gaining entrance into the system, endeavour to adjust themselves to their new environment. They may seize upon a

pabulum from the blood of their host, either because of its abundance or its resemblance to that upon which they have been accustomed to thrive. The removal of the pabulum they select—consisting probably of some proximate organic principle—may be the cause of the symptoms induced; and according to that chosen, so will be the collocation of symptoms initiated. These may be indefinite, or more or less like or unlike any known type; but, in accordance with the law of the origin of species, their offspring, multiplied a millionfold, acquire an hereditary tendency to select for themselves that pabulum to which they have been accustomed, and so by gradual development is produced the specific germ of a specific disease. That some folks are more readily susceptible to a given disease than others may be thus readily accounted for, by the hypothesis that they do not present the requisite pabulum; while those cases of change of type—and which, it may be well to point out, are seldom, if ever, abrupt, but always resemble the original more or less—receive their explanation in a “struggle for existence” on the part of the organism, which, failing to find that to which it is accustomed, has sufficient strength to adjust itself to its environment, and assimilate what it can get.

That changes in the blood do occur in fevers is well known; may it not be that when chemical and microscopical research has attended more thoroughly to this point, the actual kind of loss sustained by the blood may come to light? and in this research I apprehend no little aid will be derived from the spectroscope.

These considerations I believe to apply to all “specific” diseases, though not equally so. That small-pox may originate *de novo* I firmly believe, and I consider the case of my own which I related evidence in some degree of the fact: that cases in which it appears to do so are very few and far between as compared with even scarlet fever—not to say diphtheria—I am ready to concede. In explanation whereof I would venture to suggest that small-pox, as we know it, is a disease of very high specificity, and therefore, doubtless, of very complex origin; that the improved sanitary conditions render the fortuitous concurrence of circumstances more unlikely; and that the now wide-spread custom of vaccination must have had some influence in the matter.

Questions of indefinite incubation I should expect to find easily accounted for on this hypothesis. The question I would propound is this: Does indefinite incubation occur in well-marked and typical cases, or only when there is a “struggle for existence?” When contracted from a typical case by a patient who ultimately develops it typically, cannot the incubation always be pretty definitely fixed?

To summarise :—

1. I conceive the processes of development and the origin of species to be still going on in diseases.

2. It is hypothecated that organisms not essentially disease-germs, may become so on introduction within the human economy; that the form taken by the disease depends upon the pabulum selected by the germ, and that specific characters are in course of time developed in the germs.

3. This process accounts for the *de novo* origin of the so-called acute specific infectious diseases; for abnormal cases of these diseases; and for changes of type in transmission.

4. This process is probably evolving, through the many unclassifiable and abnormal cases, fresh "specific" diseases in the future.

And, finally, if I may without presumption venture to indicate a few lines of research, I would say :—

1. It is to abnormal rather than to normal cases that I would look for the future settlement of the question.

2. It is desirable that in cases of infectious disease, where no origin can be traced, special attention should be paid to any irregularities indicating imperfect or progressive development.

3. In cases of seeming change of type, special inquiry should be made into hereditary predisposition.

4. Further chemical, microscopical, and spectroscopical examinations of the blood should be made in fever cases; especially comparing the results in cases respectively of typical and abnormal characters.

5. Finally, special attention should be paid to cases and epidemics of such affections as form prominent symptoms in certain well-established diseases: *e.g.*, infectious sore throat, and the question of its development into scarlatina or diphtheria; catarrhal diarrhoea, and its relation to typhoid fever; and the relation of r  theln, which is undoubtedly autogenetic to measles and scarlatina, which are commonly held to be specific.—*British Medical Journal*, Sept. 30, 1882, p. 629.

3.—ON POINTS OF RESEMBLANCE BETWEEN TYPHOID FEVER AND DIPHTHERIA.

By ANDREW KEY, M.D., Montrose.

For many years I have been convinced that there is a close connexion in some respects between these two diseases. I shall state my case most clearly and succinctly by referring at once to notes of various outbreaks of diphtheria which have occurred in my practice, and which I think go far to establish my views.

During the summer of 1873 we had a sharp epidemic of diphtheria in Montrose and the surrounding district. In the

beginning of July of that year I was asked to visit the child of a farmer. I found her suffering from diphtheria. It proved to be of a very malignant type. Six children and two maid-servants were attacked, and it proved fatal in the cases of three children and one of the maid-servants.

The farm-house was built in a most salubrious situation, standing on a rising ground facing the sea. The farmer was a most intelligent well-educated man, fully alive to the necessity of attending to and obeying sanitary laws. On my first visit I told him that there must be something at fault with his water supply or drainage, some grave insanitary condition. I was told that this was not so, as he had particularly attended to all these things. The water used in the house was got from a well near the sea, and he had been at the trouble to get it analyzed by a practical chemist in Edinburgh, who had pronounced it to be pure and free from all organic matter, and fit for domestic use. I went over all the place, and could find nothing to confirm my suspicions. There was no w.c. in the house. A convenience was placed at the foot of the garden, and it was very sweet and clean. And yet, notwithstanding all this care, during a twenty years' occupation of the farm there had been seven outbreaks of typhoid fever—three in the farm-house and four in the families of his ploughmen.

There was a pond close to the house, containing a supply of water used for driving the threshing-mill. One day, when visiting, I found this pond dry, and the smell from it was decidedly offensive.

Making inquiry, I was told that its supply of water was derived from a small stream which came down past a mansion-house half a mile distant, and that the whole drainage from this mansion-house, including several water-closets, passed into this stream, and so was intended to be carried to the sea; but a dyke was thrown across it, and a pipe there put in for diverting part of the water to this pond. I went up and examined the stream at this dyke. Being in the middle of summer, there was a small supply of water, so much so that the whole of it was finding its way into the pipe, and all the drainage of the mansion-house was conveyed into the pond. Further, I found that a connexion was laid on from this pond to the kitchen of the farm-house and that the water was used for washing kitchen utensils, etc.; but the servants were strictly enjoined not to use it on any account for cooking or drinking. The well supplying the pure water was at a distance from the house, the pipe from the pond was very convenient, and the cook admitted that she often used it for making soup, etc., when the proper supply was done. The farm-servants used the water from this pond habitually, as it was so near.

When this outbreak of diphtheria occurred there was no sickness of any kind in the mansion-house. I suppose no one will deny that the different outbreaks of typhoid fever were due to the use of this impure water, and I have no doubt the outbreak of diphtheria was caused in the same way. Dr. Johnston of Kair saw this family in consultation, and he agreed with me as to the cause of the mischief. It must be remembered that at this time—in 1873—diphtheria was rife in the town and neighbourhood,—not typhoid fever,—and I am of opinion that the same insanitary conditions which at one time produce typhoid do at another time produce diphtheria. I do not think it has been proved that there is one poison producing typhoid, and typhoid only.

In March 1874, the epidemic of diphtheria not having yet exhausted itself, I was called to see two children aged two and four respectively. Their father was a labourer, and they lived in one room in a rather unhealthy part of the town. It was diphtheria of a malignant form. One of them died, and the other had a sharp struggle for life, but ultimately recovered. I had only been attending in this family for three days when I was asked to see a child, a girl of seven, living in the same house, but in a flat above. This ultimately proved to be a severe and most characteristic attack of typhoid fever. So we have here, in one house, diphtheria and typhoid going on together. This little girl was very lame, and had scarcely been to school, rarely out of the house, and my two diphtheritic patients were never away from home. Is it too much to assume that it was the same poison which produced the two distinct diseases? If I am right in my hypothesis, it will require further investigation to show why at one time the same insanitary condition causes diphtheria and at another typhoid, and I confess that I can throw no light on the subject.

I will now go back to the year 1860, when I was in practice in Arbroath, a town not then properly drained, and which was almost never free from typhoid and frequently scourged by diphtheria. I think it will be found that typhoid and diphtheria have a liking for the same localities. In this year, 1860, diphtheria was very fatal in Arbroath. It broke out in a gentleman's family living in a newly-built house in one of the healthiest suburbs of the town. The gentleman was fully alive to the advantage of good drainage, good water supply, and sound sanitary conditions. All his family of three healthy children died in ten days. I pointed out to him that I believed thoroughly that diphtheria arose from insanitary neglect of some kind. His house was built under his own supervision, and, without entering into particulars, I will just say that we were fairly baffled to find any cause for the outbreak. Years

after, when on a visit to me in Montrose, this gentleman said, "I now know why my children had diphtheria;" and this was his story. The ordinary water-supply for domestic purposes was very hard, although pure, and was almost unfit for use in making tea, soup, etc. His house being out of town, and slated with Welsh slates, he had a stone cistern built to receive the rain water. This cistern he covered carefully with stone flags, and before using the water he had it twice filtered. But he had made one grand mistake. The overflow-pipe of the cistern was connected with the drains, and was *not* trapped. The gases from these sewage-pipes came up into this cistern and impregnated the water. I think if the history of this cistern had been told to a number of medical men, they would most likely have unanimously agreed that the disease produced, and which proved so fatal, would be typhoid; and yet it was diphtheria, certainly arising from a cause most generally productive of typhoid.

Once more, in May 1874 I was called one evening to see a very healthy married lady, aged 30. On examination I found a suspicious appearance of the throat, but I could not positively decide that it was diphtheria. Next morning (Sunday) there was no longer any doubt. I told her husband that he should send all the children away at once from the house and the source of the mischief, whatever that might be; but on examining them I found the youngest, a boy of two, already ill. A nurse and the other three children were sent off by rail in the afternoon to some friends at a distance. This lady died; the child was very ill, but although I gave a most unfavourable prognosis, he recovered. The medical attendant of the family to whose care the other children were entrusted visited them daily. As already stated, they left home on a Sunday, and remained quite well all that week. But on the Tuesday following the youngest girl, aged four, was down in diphtheria, and was dead in a week. There were no other cases. This family lived in a very badly drained house. Most of the houses in this part of Montrose had then cesspools attached to them. The servants had often complained of offensive smells in the kitchen, and of being sick and suffering from diarrhoea, and it was resolved, just before this outbreak of diphtheria, to have an investigation made. The result was the discovery of a cesspool in the court, within a few yards of the kitchen, and connected with the sink. This was emptied for the first time for at least twenty-five years, its existence not being even suspected, as it was thought that the house was drained into the estuary of the South Esk. Unfortunately, the contents of this cesspool were conveyed to an ashpit at the foot of the garden. I must state again that the mother and the two youngest

children were the only cases of diphtheria. The father, two eldest children, and the three servants escaped. Why was it so? The lady had poultry, of which she was very fond, in a house close to the ashpit, full of the contents of the cesspool. She used to go there often with her two youngest children, lingering about the poultry-house; but the ashpit was so offensive that at the end of a week she complained so much to her husband that he had it emptied, unfortunately when too late. I think there can be little doubt as to the origin of the poison here. The three persons most exposed, or alone exposed, to its influence had diphtheria; and if, instead, they had suffered from typhoid fever, it would have been considered quite a natural sequence. One other point in connexion with this family is of importance. The case of the little girl proves that diphtheria may have a period of ten days' incubation. She was examined carefully every day, so that the first symptoms were at once discovered. So much for the origin of the two diseases.

One other point of resemblance lies in this, that the two diseases are essentially confined to childhood and the prime of life. I have seen one case of typhoid fever where I could make a perfectly accurate diagnosis beyond the age of fifty-two, and I have only seen one such case; my oldest diphtheritic patient was forty-five. Very likely my experience is different from that of other observers; but I have seen a great deal both of typhoid and diphtheria, and my attention has been very closely directed to both diseases.

Again, my experience has convinced me that diphtheria, like typhoid fever, is most fatal in the middle and upper classes of society. I dread it most when it shows itself among my better-class patients; and I have seen the most unlooked-for recoveries. The very worst cases do well when occurring amongst the labouring population.

Is there any analogy between the exudation in typhoid fever in Peyer's glands and that on the fauces and larynx in diphtheria?

And now I come to the last point of resemblance between the two diseases which I shall touch upon to-day. I believe that neither are infectious in the same sense as scarlatina and smallpox are, or if they are, that they are feebly so. I know that I am very far from being orthodox in this opinion, but I find that many practitioners are gradually coming round to it. I think this is now almost the general belief as regards typhoid fever. Not long ago I met a medical friend, and our talk drifted diphtheriawards. He had just been sadly worried by an outbreak in his practice (and he was a man who could worry). He heaved a sigh of relief as he said, "What a com-

fort it is that it is not infectious!" If my idea as to diphtheria being due to a local source of poison be correct, it slips into the same position as typhoid fever. I can only say that I have never once in my practice traced an outbreak of diphtheria to infection. I hold that if any one, through impure drinking water, infected atmosphere, or other insanitary condition, is made ill, and tangible disease produced, you may have typhoid fever, diphtheria, or simply diarrhoea, and that these diseases are produced most readily by imbibing fæcal excretions; that the origin of these diseases, in the great majority of cases, can be traced to a source of this kind, and not to infection; moreover, that these diseases have grown with the growth and developed with the development of our present water-closet system, and that by careful attention to this source of infection and the water-supply of the house you can almost certainly banish these diseases from a family.—*Edinburgh Medical Journal*, May, 1882, p. 976.

4.—ON THE SALICYLATE TREATMENT OF RHEUMATISM.

By C. S. CLOUSTON, M.D.

Dr. Prosser James recommends the salicylates of ammonia, potash, lime, quinia, and cinchonidia in cases where it may be thought that any of the bases mentioned may be given with advantage. Being anxious to test the value of salicylate I avoided any combination which might be supposed to affect the result; but doubtless the salts of ammonia, quinia, and some others, may be specially serviceable in many cases. Dr. Fowler, as already stated, uses the natural salicylate, which he says is less liable to produce toxic effects. Drs. MacLagan and Charteris prefer salicine.

The taste of salicylate is well disguised by the addition of half a drachm of syrup of ginger, a few drops of chloric ether and 2 drachms of peppermint-water to each dose. Or a drachm of syrup of orange or lemon may be given instead; or half a drachm of syrup of ginger and the same quantity of tincture of orange. In this last form I have seen 10 grains of salicylate every hour well borne in a case where there was considerable nausea before the medicine was begun.

Dose.—The whole success of the treatment depends on the amount and frequency of the dose, and on this great stress must be laid for many of the so-called failures of salicylate are clearly due to giving too little. I give 10 or 12 grains of salicylate of soda every hour till pain is relieved or ringing in the ears comes on. Before using salicylate it is well to give an aperient if required. If this precaution be neglected headache or sickness is more likely to occur, in which case the salicylate should be stopped and an aperient given.

Marked relief is generally experienced after the 5th or 6th dose, and slight tinnitus is frequently felt about this time. The further administration of the drug must depend on circumstances and the susceptibility of the patient to its influence. It ought, however, to be pushed as rapidly as possible until pain is gone and temperature normal, after which it is well to continue salicylate or, perhaps still better, salicine 3 or 4 times a day for a few days, temperature being meanwhile carefully watched and more frequent doses given if it should rise. This precaution will generally prevent relapses.

A smaller dose than I have stated was tried in case 24, but with less effect: and in some other cases (4, 12, 21, and 25) the doses were given by the attendants either too seldom or in too small quantity, the result being a delay in recovery.

Again, a larger dose than I suggest, more especially if given at the outset, is apt to produce unpleasant symptoms, such as sickness or headache. I have seen $17\frac{1}{2}$ grain doses, though only given every 4 hours, produce severe tinnitus after about the second dose. In case 9, too large doses were taken by mistake (about 16 grains every hour). Tinnitus came on after the fourth dose and there was sickness next day, the intolerance of the drug produced by the large doses at first not having passed off.

Thus we may conclude that a smaller dose than 10 or 12 grains every hour will not produce sufficient effect, and that a larger dose, if given at the outset, is apt to cause gastric and other disturbance, which may delay the treatment for some days. The great secret of success is to give frequent small doses at first. Toleration is thus soon established, so that soon large doses may, if required, be given without unpleasant symptoms resulting. Ringer advocates a 10-grain dose every hour, to be increased to 15 or 20 grains if necessary after 24 hours. I have seldom required to use the larger dose, though when the ordinary dose fails to produce a sufficiently rapid effect it should be had recourse to. In case 12, I raised the dose to $18\frac{3}{4}$ grains, the largest I have used, and only given after ordinary doses had been used for some time. After the drug has been given sufficiently long to show that the patient is not unduly sensitive to its influence the dose may be raised to 20 grains and given less frequently, the amount given daily being thus unaltered.

[Dr. Clouston gives a table showing the amount of salicylate given in each case for the first 7 days, from which it will be seen that males took a larger amount than females, and the severer cases required more than the milder ones.]

Salicine must be given in much larger doses—from 15 to 30 grains. I gave 240 grains in 24 hours, in case 4, who took the

medicine for about 5 days, the total amount taken in that time being 780 grains.

As a local application I used a solution of salicylate of soda in water (3 ii—3 i) in cases 7, 15 and 26, where tenderness of a single joint remained after the acute attack was over, enveloping the joint with lint soaked in the solution. Rapid relief was afforded in each case, and I think this method is well worth a trial, though my experience of it is insufficient to warrant any more definite statement as to its value.

Mode of action.—This appears to be the same whether salicine, salicylic acid, or salicylate of soda is given. Ringer, Stillé and Maisch, and Senator, hold that salicine is converted in the body into salicylic acid, which probably produces the characteristic effects. Dr. Maclagan however considers that there is no evidence of this conversion. Ringer states that the alkaloid will not yield its own weight of acid, and its effect is therefore less marked. He has never seen salicine produce the quick and great reduction of temperature that follows the use of even smaller doses of the acid or salt. He gives a full account of experiments which were made with the view of testing the comparative value of the drugs, the result indicating the greater power of the acid. Salicylate of soda owes its activity entirely to the amount of acid it contains, which is equal to nearly seven-eighths of its weight. Whether the acid or its salt be given, Squire states that in the blood it is invariably found in connection with a base. Binz says that the nascent carbolic acid which is constantly being evolved from the animal tissues absorbs the soda in the blood, the acid, which is the active part, being then liberated.

The *modus operandi* is stated by some observers to be at all events partly due to the physiological action of the drug, Köhler considering that its influence on the vaso-motor nerves leads to dilatation of the peripheric vessels and consequent lowering of the temperature of the blood, while Squire considers that the relief of pain is effected either by this relaxation of the small vessels or by a soothing effect on the peripheral nerves, the effect on pulse and respiration being due to its action on the pneumo-gastric nerve.

But I think it is clear that salicylates have a further specific action on rheumatism, and this view is held by a number of observers (Broadbent, Maclagan, Charteris, Buchanan-Baxter, &c.). The marked effect produced cannot be due to the antipyretic virtues of salicylate, which are inferior to those of quinine, and the physiological action cannot account for the rapid relief afforded in rheumatism, which is frequently well marked before the ordinary physiological effects of the drug are visible. How the specific action of salicylates is exerted

we cannot at present tell. Those who maintain that rheumatism is "generated by and within the body" (Aitken) may accept Dr. Squire's view that the acid acts as an antiferment being liberated from the soda in the blood, as held by Binz, "exactly where the fermentation peculiar to rheumatism can be stopped at its origin," and there at once neutralizing the poison. Again those who hold that rheumatism has a malarial origin, and is due to the action of bacteria (Thoresen, &c.) must still look on the acid as the active principle, the salt having but small antiseptic power. But however interesting such speculations may be, we have not as yet any trustworthy evidence sufficient to warrant any positive conclusion as to the mode of action.

We have thus seen that when rheumatic fever is treated by salicylates—

(1) The *duration of the acute stage under treatment* is reduced to three or four days, or about half its average duration under alkaline treatment; and this effect being at least as obtainable by treatment at the outset of the disease as later on, the *total duration* is reduced by *early treatment* to four or five days.

(2) The tendency to heart complication is probably less than under any other treatment; but the full value of salicylate in reducing this risk can only be obtained by early treatment, which shortens so greatly the period of susceptibility.

(3) Convalescence is generally rapid and satisfactory, while relapses are rare if adequate precautions are taken.

(4) The best results can only be obtained by early treatment, and by rapidly saturating the system with frequent small doses (10 or 12 grains every hour) until marked benefit results and the acute symptoms disappear, after which the salicylate may be gradually discontinued, the patient being meanwhile closely watched, and the medicine at once resumed in full doses if temperature rise or pain return.

The present paper is limited to the consideration of the use of salicylates in articular rheumatism with elevation of temperature. Its effects are most marked in recent acute attacks affecting the larger joints, and least so in the adynamic type of the disease so frequently seen in those who have had several previous attacks. In chronic articular rheumatism its effects are less certain. In muscular rheumatism, which is a distinct disease, I need only say in passing that salicylate appears at times highly beneficial. Its action is, however, uncertain, and depends, I believe, in some measure on family idiosyncrasy.—*Practitioner*, June 1882, p. 408.

5.—SOME OBSERVATIONS ON RHEUMATISM AND GOUT,
WITH A NEW DEPARTURE IN THEIR CURE.

By ALEXANDER HARKIN, M.D., F.R.C.S., Belfast.

In a paper on "The Pathology and Treatment of Acute Rheumatism," which appeared in the Dublin Journal of Medical Science, October 1881, I gave the particulars of thirteen consecutive cases of acute and subacute rheumatism, in my own and in the hospital and private practice of Dr. J. Walton Browne, surgeon to the Royal Hospital, Belfast, in which, by means of a topical remedy, and practically without administering a single dose of medicine, the cure was, in almost every instance, at once simple, rapid, and complete. In that treatise, I ventured to predict that, should the pathology of gout be found to be identical with rheumatism, it might be discovered that, owning a common origin, they might also prove amenable to similar cure. A typical case of gout having soon after occurred, in which the remedy for rheumatism produced a like happy result, I propose to relate the particulars of that case and one of acute rheumatism; from which we may gather the converse of the proposition—viz., that both having proved amenable to similar treatment, we may fairly infer a common origin, *pro tanto*.

Case 1.—Acute Rheumatism.—On October 24th, 1879, I visited subconstable H., aged 30, married. He had a rigor on the 21st, followed by pain in the left knee and thigh, which were now red and swollen. On the 25th, pain had extended to the right knee, both ankles, and shoulders. On the 26th, the left elbow was also affected; perspiration was acid and profuse; his urine scanty, and loaded with urates. On the 27th, his state was unchanged. I ordered an opiate at bedtime. He had been previously laid between blankets, and his joints enveloped in cotton-wool. On the 28th, he was no better; he had not slept for a week. At 1 p.m. his temperature was 102°; pulse 108. No cardiac affection was perceptible. I then applied a blister, four inches by three, over the region of the heart, to be replaced with cotton-wool at the end of eight hours. On the 29th, I found the patient completely relieved. His countenance was cheerful; his tongue clean; thirst diminished; perspiration gone; urine copious and clear; temperature 98°; pulse 90. He told me that he began to feel relief at 6 p.m., just five hours after the application of the blister; that soon afterwards he fell asleep for the first time for many days; and that, having had occasion to rise in the night, he walked unaided across the floor, and only remembered his pains after getting into bed. And thus, although on the previous day paralysed in every joint, he was now able without pain to flex and

extend them all, and to sit up in bed with ease. On looking at the joints, every trace of redness had departed, and the swelling was very much diminished, and they could be grasped firmly without pain. On the 29th and 30th, he was still improving. Pulse 90; temperature normal. The swelling and pain were absolutely gone from every joint. On November 1st, the pulse was 84; temperature normal. Convalescence was complete, and my visits terminated. A week later he walked to my house, a distance of half a mile, and he soon afterwards returned to duty.

Case 2.—Gout.—John W. consulted me on June 15th, 1881, for a severe attack of tonsillitis. I found him next day confined to bed by a well-developed fit of gout, to which he and several members of his family were very subject; having himself suffered regularly from its visitation every spring and autumn for the previous six years. His previous illness happened in Cork, continuing for six months, during four of which he was treated by a very experienced Cork practitioner, and the remaining two months by an eminent physician on the staff of the London Hospital. When removed to London he was crippled and deformed in every joint; his fingers, hands, arms, legs, and feet were curved and flexed, and he could not move without the aid of a crutch. He was, however, ultimately cured. On examination, I found his right great toe and knee swollen and painful, his heart-action excessively weak, pulse very feeble, 100; temperature 101.4° ; skin hot and dry, countenance flushed and anxious, urine clear and plentiful. He had passed a sleepless night, and, to relieve pain, he had plunged his right foot into a pail of cold water, where it remained all the night preceding. I ordered him an ounce of whisky in a teacupful of milk every four hours, wadding to the affected joints, and a blister 6 by 3 inches to the region of the heart for eight hours; no medicine. On the 17th, he was greatly relieved, his countenance was cheerful and pale, his skin cool and perspiring freely, urine unchanged. He had slept for an hour and half; pulse 91, still weak; temperature, 100.6° . The heart's action was feeble, the second sound imperceptible. The pain, swelling, and redness were almost gone from the great toe, part of the left foot and little toe were red and swollen; he had no pain. On the 18th, the right great toe was absolutely well; he had slept well. The heart-sounds were unchanged. The whisky and light nourishment were continued. On the 19th, temperature was normal; pulse 90, feeble; both feet were quite well; the left knee was swollen and painful, the right slightly so. As he had had some weak fits after slight exertion, approaching to fainting, I asked Dr. Seaton Reid to see him in consultation. He recognised the gravity of the case,

the absence of the second sound, and advised an increase of the stimulant and another blister to the heart, alkaline lotion to the knees, and ammonia and other diffusible stimulants internally. The lotion was used, but the medicine, through neglect, was not taken. On the 20th, patient experienced great relief from the second blister. He had slept well; the joints were much improved; pulse 90; temperature 98°. The heart was acting more vigorously; the throat was almost well. On the 21st, he was able to sit up and walk about, the heart-sounds were improving, the second sound had returned. The knee was almost quite free from swelling and pain. On the 22nd, he began to walk on crutches; I found him in the garden. The stimulants were gradually reduced. On the 23rd, he had dispensed with supports; all pain and swelling having disappeared; his appetite and strength were returning. He betook himself to his ordinary avocation, and my visits ceased. He informed me that he had never experienced so violent an attack, and never recovered so quickly or completely; and his delight was great at being spared the infliction of a single dose of medicine. Five days sufficed for the cure.

These cases, irrespective of their individual importance, afford subject matter for contrast and comparison. No. 1 is the prototype of thirteen published and many unpublished cases. No. 2 represents itself alone; for so far they agree in the simplicity, rapidity, and permanency of their cure, in its being effected by an external remedy, without any internal medication. No. 1 was free from perceptible cardiac ailment; No. 2 suffered from protracted weakness and rhythmical deficiency of beat; the fall of temperature in the first case was accompanied by immediate cessation of profuse perspiration, and by normal excretion of urine as to quantity and quality; while in the second case, with the fall of temperature, the hot dry skin became cool and moist with plenteous perspiration, and urine of normal quantity. The blister in the first case appeared to have restored the inhibitory power of the heat-centres, and to have reduced to their normal condition the powers of the centres which regulate heat-dissipation; while in the second case, the blister seemed to equalise the heat depression with that of production; the superficial vaso-motor and other nerves causing relaxation of the smaller vessels and secretion of sweat and consequent reduction of temperature. As to the pathology of rheumathritis, my conviction is, that it is essentially a specific form of endocarditis of neuropathic origin, generally allied with myocarditis; that in its unchecked progress, it speedily modifies the composition of blood, the innervation and calorification of the body; in its ordinary course giving rise to lesions in the textures, the joints, pericardium,

pleura, the neurilemma, the meninges of the brain; in fine, in any organ accessible to nervous or arterial influence. Pathologists such as Pfeuffer and Hueter, quoted by Senator in Ziemssen's *Cyclopædia*, vol. xxi., also look upon cardiac disease as the primary change, and articular troubles as the consequence. Hueter states "that endocarditis may be present without giving rise to either subjective or objective symptoms; that it may very well precede the inflammation of the joints, even although not recognised till afterwards"; and says also that "its presence must be assumed in those cases which appear to run their course without any cardiac complication whatever." According to Watson, Hope, Graves, Fuller, and others, endocardial and exocardial inflammation may occur as the first, and be for some time the only, local symptom of the disease; and the cardiac complication sometimes precedes, even by several days, the access of articular redness and swelling (Aitken, vol. i, p. 805). Bouilland taught that one-half, other writers one-third, or a less proportion, of rheumatic patients were always affected with endocarditis. This difference of opinion arose mainly from some of those observers mistaking the results of inflammation for the signs and symptoms, and consequently only recognising those as true cases of endocarditis in which they could detect by auscultation the changes worked by inflammation in the valves or lining membrane. This faulty procedure may, perhaps, explain the cause of the discrepancy shown in the returns of endocardial troubles exhibited at the meeting of the Medical Society of London referred to. Such returns, averaging from 3 to 76 per cent., can afford no guide on the subject of the incidence of heart-affections, and would suggest, in the majority, an absence of diligence in diagnostic work.

It is now generally admitted that the exciting cause of acute rheumatism, as of pleuritis or pneumonia, is a chill; and that the effect is produced through the medium of the nervous system; and that, although the integument alone may be directly chilled, the deeply seated internal organs also suffer. The immediate effect of cold upon the nerves of the surface is to lower their functional activity, and to increase the action of the nerves of the internal organ in relation with that part; endocarditis thus becoming the first step in the development of acute rheumatism after exposure to cold. If it be physiologically true that, when two parts of the same body are nervously in sympathy with each other, if we produce a powerful action in the nerves of one, we may withdraw vital energy from the nerves of the other, then it follows that, when a derivative in the form of a blister is applied in the nearest vicinity to the endocardial lining when in an inflamed state, it is but carrying into

effect the principle that counter irritation is the most effective plan available to alter the excited condition of nerve-centres, and so to influence motor, sensory, and trophic nerves. Further, if experience tell me that counter irritation over the heart is a potent remedy for the cure of acute rheumatism in all its phases, this fact will surely throw light on the nature of that disease. According to Dr. Peter Latham, "the treatment of diseases is in fact a part of their pathology. What they need and what they can bear, the kind and strength of the remedy, and the changes which follow its application, are among the surest tests of their nature and tendency." And Cullen, in the preface to his Nosology, page 16, says that "remedies cure diseases only in so far as they remove their proximate causes." When, therefore, a blister over the region of the heart cures endocarditis and its articular complications, it would surely not be unsafe to infer that the proximate cause is located in the heart itself.

If then, it can be satisfactorily established that acute rheumatism may be cured by a topical remedy alone, what becomes of all the theories based on the idea of its zymotic, its constitutional, or autogenetic origin, and the sundry modes of treatment, and the antidotal remedies devised for the removal of the hypothetical condition of the vital fluid—eliminative, antacid, or otherwise? That it may be done—that it has been done in a number of cases—I have satisfied myself, and, knowing how prone human nature is to self-deception, I have guarded against the personal element by inviting the presence and co-operation of several medical men of the highest ability and scientific acquirements, as witnesses.

My chief desire is, that my simple plan for the cure of rheumathritis shall be thoroughly tested by the profession at large; of its efficacy, my own experience, and that of a number of my professional brethren, assures me. I cannot expect, however, that every one who may be equally convinced by personal trial and experience, shall also accept my explanation of its *rationale*. The pathology and physiology of the nervous system are not yet established on sure grounds; its supposed laws are subject to many contradictions, which only a more extensive knowledge of its principles and their application can elucidate. Nor would I wish to appear as proclaiming its efficacy in every case. I am satisfied, indeed, that endocarditis will still claim a place in the sad category of fatal diseases; but I also feel that, in cases possible of cure, the abortive plan proposed must claim precedence as the most rapid, safe, and permanent; from its very nature, the most potent to anticipate or remedy functional or organic disorder in the heart and its appendages.—*British Medical Journal*, Sept. 23, 1882, p. 554.

6.—ON THE MATERIALS OF BLOOD-POISONING :—IS MALIGNANT DISEASE PARASITIC ?

By RUSHTON PARKER, Esq., B.S., F.R.C.S., Professor of
Surgery, Liverpool.

The germ-theory of disease is so far a reality, that spirillum is the demonstrated organic cause of relapsing fever, bacillus anthracis that of splenic fever; while the local and constitutional changes in septicæmia, pyæmia, and acute suppuration, are equally proved to be due to the presence, propagation, and influence of bacilli and micrococci of various sizes and differing degrees of irritative or toxic virulence.

In reviewing the germ-theory of infective disease in general, and of traumatic infection in particular, it may be convenient to allude to two distinctive types severally represented by septicæmia and pyæmia. Many of the infective diseases having been proved, most of them are provisionally supposed to be due to organisms imported in some way from without. The organisms present in decomposing animal fluids are both numerous and various, yet they are, fortunately, "pathogenic" only in an extremely small minority. Some of them are always present in decomposing, and under certain conditions in suppurating, wounds; while, even in health, the cutaneous and mucous surfaces may be peopled with organisms of several distinct kinds. Under the type represented by septicæmia may be classed anthrax (and possibly also measles, typhus, and their associates), where the blood is simply polluted with an organism or with its products. Septicæmia proper seems to be of two kinds: (1) septic intoxication or toxæmia due to sepsin evolved by the septic bacteria (themselves confined to a putrid part of the patient or victim); and (2) septic infection or toxæmia in which the septic bacteria themselves enter the blood. In the septicæmia of mice, bacilli are the form of organisms concerned, and found in the blood, or in the infected wound, or in both. But they are often not to be found in casual specimens of the blood, owing to their more numerous accumulation in the capillary vessels rather than in the main blood-stream.

In pyæmia, as investigated in rabbits, the organisms concerned are micrococci. There have been changes of opinion as to the appropriateness of the word pyæmia, as a descriptive term, especially in the old sense implying a suppuration of the blood, seeing that the introduction of pus into the blood had chiefly a negative value in the attempted experimental production of pyæmia. But, since Mr. Lister showed, in his observation of the breaking down of the infected blood-clot in a donkey's vein, that a genuine suppuration of the blood can indeed take place, the rational value of this necessary tradi-

ditional expression is once more established. Pyæmia is characterised by a clotting of the blood, and the distributed infection of an organic ferment. The micrococci crowd together, increase the adhesiveness of the corpuscles, and promote the clotting of the blood, even in capillary vessels. The thrombi, whether large or small, are foci for the further development of the micrococci; and hence all the secondary phenomena, which, like the primary, may be suppurative or not.

In septicæmia, the bacilli kill by poisoning the blood, without giving rise to secondary inflammations or primary local manifestations; whereas in pyæmia, the micrococci cause clotting of the blood, and set up embolic pneumonia, nephritic infarcts, and perhaps also suppuration of the joints. The micrococci do not seem to be in themselves always so extremely poisonous; but, by giving rise to suppurative or other organic changes, indirectly lead to death by perversion of visceral functions.

What is the immediate cause of death in perforation of the bowel? The general answer is, "Collapse," which is indeed true enough when collapse actually takes place. But how are we to explain the cases where neither collapse nor death occurs? Perforation or rupture of intestine, with diffusion of contents throughout the peritoneum, is followed by peritoneal absorption, and the collapse is septicæmic; but a similar occurrence into the tissues, and not into the peritoneum (or only gradually and slowly into that serous sac), is a sure cause of acute (because putrid) abscess, but is often followed by recovery. A similar explanation attends the fatality of intestinal gangrene—as a complication, for instance, of strangulated hernia. It is a modern canon of surgical pathology that, in gangrene of any superficial part, putrefaction will occur unless circumstances specially prevent it. Dry gangrene may spontaneously fail to putrefy, except at the moist line of demarcation; but moist gangrene will infallibly putrefy, unless the timely disinfection of the superficial surface be artificially undertaken. But, if this be successfully done, the disease may be arrested, its spread prevented, and its disappearance accomplished, without loss of substance.

In the case of the intestine, no such prevention can be practised, so putrefaction invariably attends the establishment of gangrene, demanding the prompt and free excision of this (as of any equally advanced) gangrenous organ.

A case of hernia, three days strangulated, recently came under my care at the Liverpool Royal Infirmary. At the necessary herniotomy, I removed twelve inches of bowel, with some omentum, and the patient for a time did perfectly well, in fact nearly recovered, but eventually died collapsed. After the post-mortem examination, it was found that fresh patches

of gangrene had appeared in other parts of the intestine, and thus the temporary relief and the ultimate death were both explained. Cases have been already reported in which this operation has been perfectly successful.

Although bacilli are the characteristic organic poison in the septicæmia of mice, and micrococci in the pyæmia of rabbits, it is to be noted that Koch found rabbits liable to a true septicæmia produced by micrococci differing in shape, size, and distribution from those producing pyæmia in the same animal.

Tubercle is an infective disease, now known to be due to an organism which gives rise to the characteristic manifestations. These are both anatomically and physiologically allied to pyæmia. Opinions have, in the past, been apparently divergent as to the supposed real nature of tubercle; for instance, one school of able observers held that it was a purely inflammatory process, while another equally able, and its allies, have always regarded it as a specific disease due to an infective virus. No doubt the histological phenomena of tubercle are consistently explained as inflammatory, and so are those of pyæmia. But what causes the inflammatory changes? The very specific virus once thought to be an explanation antagonistic to the former, but now woven inseparably into it in the form of the tubercular bacillus so admirably discovered by Dr. Robert Kock.

Syphilis again presents many features analogous to those of pyæmia, and some have even alleged that they have seen a special syphilitic germ. But though this is not yet sufficiently proved, it is probable that such a germ exists. As for gonorrhœal rheumatism, its clinical features have long been interpreted as those of an aseptic pyæmia, which, fortunately for the patients, lacks the anatomical proofs that might be afforded if it terminated fatally; while ulcerative embolic endocarditis is a true aseptic pyæmia on the best anatomical evidence.

There is another infective disease which I venture to compare with pyæmia, and that is malignant disease, more especially its so-called carcinomatous varieties. Like tubercle, the inflammatory character of which is admitted on all hands, so far as the histological changes are concerned, the cutaneous, mucous, and glandular cancers have very close affinities to inflammation. The primary growths are essentially a plastic catarrh; and the round-celled infiltration, by which they are additionally indurated, shares, with the similar indurations of undisputed inflammation, a histological identity. Simple inflammations, however, are resolvable, their infiltrated products disappearing on the subsidence of the irritant cause, be it chemical or mechanical; whereas the cancerous induration is

unresolvable, be it a malignant stomatitis, glossitis, enteritis, or dermatitis, as in epitheliomas, or be it a malignant adenitis, as in mammary or other glandular cancers. Round-celled sarcoma, again, is a true infiltration of the plainest possible kind, whether it constitute a malignant cellulitis, periostitis, or ostitis, or even an interstitial orchitis or any other adenitis; and differs only from undisputed inflammation of regions and organs in its "unresolvability." But the very unresolvability of carcinomatous tumours, whether primary indurations, lymphatic infections, or disseminated visceral growths, has a distinct parallel in the similar unresolvability of pyæmic, tubercular, and neglected syphilitic phenomena.

The cachexia of acute cancer, and of acute sarcoma, when now and then it kills as a poison, without prominent local symptoms, is not unlike that of pyæmia, of tuberculosis, and even of syphilis; the lymphatic glandular infection, and all its attendant and consequent phenomena, is conspicuously similar to various forms of infective inflammation; while the malignant thrombi that form in veins, in cases of carcinoma and sarcoma alike, with the still more frequent embolic disseminations of these truly infective appearances, have a resemblance to the thrombosis and embolism of pyæmia too obvious to need defence.

More than six years ago, I was led to the assumption that malignant disease had inflammation for its anatomical type, by the histological examination and comparison of inflammation, tubercle, and cancer; and I have taught it, during the greater part of that period, as an idea justified on anatomical grounds, though not entitled to acceptance as a truth. As a mere hypothesis, I venture to suggest it here, with the intimation that many things will surprise me more than the discovery of a parasitic germ originating malignant growths.

The bacillus of tubercle, though discovered, separately cultivated, and successfully inoculated by Koch, is still most difficult to find, and then chiefly in the freshest growths. The microphytes of disease, how terrible soever be their vigour, or the initial reality of their presence, are sometimes exhausted, and even effaced, in the transformations of tissue which they themselves educe—exhausted, as noticed in tubercle by Koch; effaced, as observed by Lister in the ass's jugular. The parallel, once established, recurs even in prevention, in treatment, and in cure. Against pyæmia, the only certain safeguard lies in preventing the primary infection; in tubercle, we already extirpate the earliest manifestations when we can get at them; while, in cancer, timely excision does sometimes amount to effectual eradication. The purpose is, in all, to avoid the

dreaded physiological "infection."—*British Medical Journal*, June 17, 1882, p. 898.

7.—ON THE DIAGNOSIS OF CHANCRE OF THE LIP AND CANCER.

By R. CLEMENT LUCAS, Esq., B.S., F.R.C.S., Senior Assistant Surgeon to Guy's Hospital.

Two cases illustrating the resemblance which these two affections often present have lately been attending on the same day, and a careless observer having regard only to the local disease and ignoring the history and age of the patients might easily have fallen into serious error. Nor is the diagnosis always easy when no fact is omitted which might influence the conclusion; but in the two cases before us, despite the similarity in appearance, there is corroborative evidence in each case, which leaves no doubt as to the nature of the disease. One patient is a man about thirty years of age and unmarried. He has a thickening of the edge of his upper lip slightly to the right of the centre. In the middle of this thickening there is a superficial abrasion on which the secretion and epithelium cake and scale. The whole lip is a little swollen, but if you pinch it between your finger and thumb you feel a hard circular rim to the sore about the size of a sixpence.

Now look at the other man. He is a respectable married man, upwards of fifty years of age. He has a superficial sore on his lower lip to the left of the medium line. The surface is almost exactly similar to the other man's sore; it is cracked, and has a tendency to scab and scale. It, too, has a thickened rim, but if you pinch it you find the resistance less than in the other case; but so similar are the sores, that if their positions could be changed I do not think you would be able to distinguish one from the other. Yet one is a cancer, the other the initial stage of syphilitic infection. How, then, can one distinguish them? First, the age and state of life make it probable that the young man's sore is a chancre, and the old man's an epithelioma; but thirty is not too young for epithelioma, nor is fifty proof against syphilis, though with age impetuosity yields to discretion. Epithelioma below thirty-five is very rare. Last year I operated on a man aged thirty-eight for a cancer recurrent in the cheek and glands of his neck which had been operated on some time before in the country; but this is an exceptional case, and the age is of the greatest importance in aiding our diagnosis. Cancer occurs at the time when the tissues begin to wear out, and epithelioma, especially, is almost always traceable to long-continued irritation.

Next, the position is a distinguishing mark in these two cases,

for epithelioma is rare on the upper lip. The position of the sore on the old man's lip is almost characteristic, it is just opposite the notch in his teeth made by his pipe. Further, he confessed to having always smoked unwaxed clay. If mere contact with porous clay is sufficient, after years, to set up cancer, you would conclude that there should be a corresponding sore on the upper lip; but the lower lip suffers most, for, owing to the weight of the bowl, the lower lip is pressed upon as well as rubbed.

A chancre may occur on either lip as it results from the virus having come into contact with a chance crack. In many cases it will depend on whether the person is underhung or overhung; for the lip most exposed is most liable to crack, and at the same time most likely first to meet in an embrace. Hunter maintained that neither the blood nor any of the secretions could convey the poison, but this is now known to be untrue. His reasoning on this point was most fallacious. If the blood, he argued, could produce syphilitic inflammation in a healthy wound, no subject affected with constitutional syphilis could escape from venereal ulcers; every time he was bled or he scratched himself with a pin, the small wounds thus produced would be transformed into so many chancres. Hunter overlooked the fact that the man's tissues by the inoculation were protected, for a time at least, from re-inoculation, but that to another both blood and secretion might prove contagious. There is abundant evidence now of the contagious nature of the blood during the secondary stage, of the vaccine from a syphilitic infant, and of the pus from the secondary ulcers on the lips; hence, there is no need to follow Ricord in his loathsome suggestions that these chancres of the lips were always the result of illicit contact.

The time during which the disease has been developing is another most important consideration in determining its character. The old man states that he has had ulceration, more or less, for five years, but that it is only during the last few months that the lip has caused him inconvenience. The other man counts his trouble by weeks, and gives six weeks as the time since he first noticed the sore. Five years is an exceptionally long history for so small a development of epithelioma, and it is very questionable whether the sore has been epitheliomatous all this time. Rather it is probable that had he left off the irritating cause two or three years ago he might have escaped from the disease from which he is now suffering, for doubtful ulcers distinctly traceable to local irritation will often heal when relieved of the exciting cause. It is now about two years ago since I saw in consultation with Dr. Orton, of Kensington, an old gentleman who had been con-

demned by another surgeon for cancer on the inner side of his left cheek. He was suffering from an ugly-looking ulcer with thickened edges, very like an epithelioma, but on inquiring into the history we found it had not been noticed more than six weeks or two months, and immediately opposite it we found a tooth stopped with an irregular amalgam stopping. It was clear that the ulcer was excited by the tooth, and I suggested that the tooth should be extracted, after which the ulcer completely healed. Had, however, the irritating cause been allowed to remain for months, it is highly probable that the sore in this old gentleman might have taken on an epitheliomatous character, and the medical man who first saw him would then have been correct in his diagnosis. Thus the time is of great importance in separating an epithelioma from a simple ulcer and from a chancre.

There is a stage in both affections when the glands under the jaw will be found enlarged, and I remember two patients came last year with sore lips, both with short histories and enlarged glands, and I refused to give a positive diagnosis till I had had an opportunity of watching them. One of these developed a syphilitic eruption during the following week, whilst the other proved to be suffering from an epithelioma growing much more rapidly than the one we have now under consideration. Time will always settle the diagnosis, for it is seldom, unless the patient takes mercury, that the eruption of syphilis is delayed beyond two months. The man before us with a chancre has now on his arms and trunk a few brownish papules which place the diagnosis beyond all doubt.—*Practitioner*, May 1882, p. 352.

8.—MALIGNANT DISEASE VERSUS SYPHILIS.

By ALEXANDER PATERSON, M.D., Glasgow.

Every surgeon, I am sure, reads with pleasure and profit anything from the pen of Mr. Jonathan Hutchinson. In the *Journal* of March 4th he refers to the clinical differences in character of malignant disease, according to its seat. Referring to certain cases of cancer of the skin of the trunk, it is stated that "In all, the ulceration progressed slowly during many years, caused but little pain, and produced no gland disease." Further on: "The disease of which I speak is most intractable, and, as far as I have observed, recurs immediately after removal." Reference is next made to an interesting case, in which Mr. Hutchinson twice removed the ulcer by the knife, and three or four times by caustic, but without benefit. "As soon as the sore was nearly healed, it recurred."

May a provincial surgeon be permitted to give a case in many respects parallel? Some years ago, a man aged 45, suffering

from epithelial cancer of the scrotum, sent for an eminent surgeon, for the purpose of having it removed. The operation was well performed. No one who saw the case had the slightest misgiving regarding its nature, but as a formal matter, the diseased structure was handed to a practised microscopist in the neighbourhood, who stated that it was epithelioma, without doubt. When nearly healed, it recurred, and was removed again, only to begin to spread when almost completely well. A third time it was taken away, with a like result. At the fourth operation, the testicle, which now appeared to be implicated superficially, was removed. When cicatrisation was all but perfect, the surgeon left town for his holidays, and shortly afterwards the patient's medical attendant requested me to perform the fifth operation, as the disease was spreading again. Having the history of the case before me, in a hopeless, half-hearted sort of way I cleared away the diseased tissues as carefully and completely as possible with the knife, and watched the healing process with much interest. Matters progressed very favourably until the healing line was reached, when once more the ulceration began. Such conduct in a chimney-sweeper's cancer appeared to me unique. I saw that operating again was useless, and as I stood pondering at the bedside, my eye rested on the shining bald head of the patient. As a random shot, the question was put as to when his hair first came out. He said his hair began to fall soon after he joined the service, more than twenty years ago. The answer gave the clue. Iodide of potassium was prescribed, when the wound rapidly and perfectly healed, and has so remained.

Last year a lady, aged 60, came to consult me regarding an ulcer on the left side of the nose. She had been recommended by her medical attendant, whose card she brought, to see me regarding removal by operation. The sore, she said, began about two years ago, as a small scab or flattened wart, and continued to increase in size slowly and without pain since that time. The ulcer was now about five-eighths of an inch in length by half-an-inch in breadth, throwing out little discharge, and surrounded by an elevated, clear, glistening border. As she was accompanied by a friend, few questions were asked, and I simply stated that it might be prudent to defer operative interference in the meantime. The patient was given a prescription for tertiary syphilis, requested to use the medicine for six weeks, and then return. She did so, and the sore was completely healed. This was apparently a small rodent ulcer, with a syphilitic origin. We are, probably, yet far from thoroughly understanding the multifarious ramifications of syphilis.—*British Medical Journal*, May 6, 1882, p. 655.

9.—ON THE PATHOLOGY OF HEPATIC CANCER.

By WM. ROBERT SMITH, M.D., F.R.S.Ed.

Cancer is found in the liver either as a primary growth or secondary to cancer elsewhere. For many years it was taught the primary variety was the most frequent, but now it is known that more than three-fourths of all cancerous growths in the liver are of metastatic origin, and of these metastatic deposits by far the larger number are secondary to primary cancer arising somewhere within the portal area.

There are two forms under which we meet with primary hepatic cancer—viz., first as a large solitary rounded tumour, and secondly as a diffuse degeneration of the entire organ, the liver meanwhile retaining its normal shape. When present as a solitary tumour, the growth is round and frequently of enormous size. Sooner or later it projects above the surface as an irregular prominence, over which the capsule becomes thickened and opaque. On section it appears as a soft pulpy growth of a greyish colour, from which a thick cream-like liquid exudes on pressure. It is seen to be traversed by glistening fibres varying in thickness; they have a reticulated arrangement, which gives the cut surface a lobulated appearance. In many places the external border is sharply defined, whilst in others the border-line between hepatic tissue on the one hand and cancerous growth on the other is indistinct or altogether wanting. As we should expect, the hepatic tissue and bile-ducts in the neighbourhood are distinctly compressed, whilst some of the larger ducts are found blocked with cancerous masses; the portal and hepatic veins also contain cancerous thrombi, and are dilated. The mass may present certain varieties of retrogression—*e.g.*, its centre may become converted into a dry yellowish cheese-like substance, owing to fatty changes in the cancer cells, or extravasations of blood show themselves as hemorrhagic infarcts, which ultimately break down into dry hard masses, and, owing to the compression of the bile-ducts, the flow of bile is impeded and the organ becomes of a yellowish or greyish hue.

The diffuse or infiltrated variety of primary cancer is but rarely met with, but when observed is found to have a highly characteristic form. The liver is enlarged in all directions, the capsule thickened, and the surface covered with slight rounded elevations varying in size from that of a pea to a small nut. On section the lobules are seen to be enlarged, although their shape and outline are still preserved; but they are more or less transformed into cancerous matter. They are separated from each other by broad tendinous bands of fibrous tissue; they are either whitish in colour or yellow or green from the inhibition of bile, and are decidedly more succulent and pulpy than

the ordinary hepatic tissue. The fibrous interlobular septa, owing to their vascularity, may have a tint varying from pink to bright red, which gives the organ a brilliant appearance. This variety of cancer, unlike the one just described, either undergoes no retrogressive change, or but slight fatty degeneration of its cells; the portal and hepatic veins and the bile-ducts are unaffected; whilst, as is also the case with the solitary growth, metastases to distant organs never occur, although the lymphatic glands found in the transverse fissure may in both cases be affected.

Microscopically, primary cancer presents the ordinary features of a medullary growth. It consists of large, round alveoli, the walls of which are composed of fibrous tissue and capillary blood-vessels, these latter being sometimes alone present. The alveoli are filled with cells which may have no particular shape or arrangement, at other times being cylindrical and symmetrically arranged. The capillaries derive their blood from the hepatic artery. These cancer cells are no doubt the direct offspring of the hepatic cells, although by some the epithelial cells of the smaller bile ducts are supposed to contribute in their formation. In both forms of the primary growth the cancerous transformation of the hepatic cells is the same, and may be studied in the various sections I have placed under the microscope. The true hepatic cells at first enlarge, by which the rows of cells become distinctly widened and separated from each other; at the same time the outline of the cells becomes very indistinct or altogether lost; the lobules then appear to be transformed into a number of protoplasmic masses, with a corresponding number of nuclei; these nuclei rapidly increase in number by the process of fission. This transformation of the hepatic cells is confined to a limited number of the rows of cells; the remainder, together with the capillaries, undergo atrophy from pressure; the portal capillaries, thus compressed together, with the connective tissue surrounding them, form the fibrous stroma of the growth; the capillaries which nourish the tumour are branches of the hepatic artery which have sprung into existence with the growth of the mass. It is, however, as a secondary metastatic growth that we have most frequently to deal with in cancer of the liver, the infecting source being generally the pyloric end of the stomach; it may likewise proceed from cancer of the intestines or peritoneum. If we reflect on the origin and distribution of the portal vein and lymphatics, we can readily understand with what ease the cancer germs may be transported. Secondary cancer of the liver appears nearly always as a number of deposits or nodes, and with extreme rarity as an infiltration.

The external appearance of a cancerous liver varies greatly.

A number of milk-white nodules may protrude on the surface, which, on section, are found to vary in size from a millet seed to that of an orange, and to be sparingly scattered through a more or less atrophied parenchyma; or, on the other hand, the liver may be enormously enlarged, presenting superficially a number of umbilicated or centrally depressed nodules, being very much like a *nux vomica* seed, and about the size of an orange. The secondary hepatic growth increases so rapidly in size, and reveals to such a great extent retrogressive changes, that the primary infecting source is in danger of being overlooked, for very frequently the primary growth causes no very marked symptoms, and unless systematically looked for the actual site of origin of the lesion is often overlooked, for the secondary growth of the liver is so large that it readily obscures the primary and insignificant one of the pylorus. About five-sixths of all cancerous growths in the liver have a metastatic origin, and of these two-thirds are secondary to primary cancer in the portal area, and one-third to primary cancer elsewhere, being very rarely metastatic to cancer of the skin. There can be no doubt that these growths are due to the presence of cancerous emboli in the branches of the portal vein or hepatic artery. The nodes which are seen on section scattered throughout the liver substance vary much in number, size, and general character; they may be so small in size and so limited in number that they may escape suspicion during life, and be only accidentally discovered at the post-mortem. Generally, however, they are scattered irregularly throughout the organ, in numbers varying from two or three to fifty or sixty, or more, at the same time presenting the greatest differences both in size and shape—the size varying from minute granules imperceptible to the naked eye to that of an orange or cricket-ball, the average size being that of an egg or an orange, whilst the usual shape is globular. They are sharply circumscribed, but not encapsulated, and they cannot be easily detached from the liver substance, which is in immediate contact with their borders, although neither compressed nor altered in character. These nodes increase in size in one of two ways: they grow at their margins by progressively invading the healthy tissue, or they coalesce with smaller nodules in the immediate neighbourhood, but at the same time the central portions fall into a more or less rapid degeneration of the fatty, caseous, or calcareous variety, which is the cause of the characteristic cupping. In the unaffected parts of the liver there is usually great hyperæmia, which doubtless has something to do with the enormous enlargement of the organ which so commonly takes place; often, too, the liver appears intensely yellow from retention of bile in consequence of com-

pression of the biliary ducts, but it is important to note that the liver substance seldom exhibits signs of compression, the foreign growth apparently taking the place of the normal tissue.

If we examine these nodes a little more closely we shall find that in all their essential details the characteristics of the infecting growths are repeated. On the surface they are usually of the scirrhus variety, more internally they are of the medullary type, a creamy juice exudes from the cut surface in variable quantity, which microscopically exhibits the ordinary appearances. On the surface we have already noticed that the growths rise at their edges, and if we trace them downwards we shall find them to be rounded masses lying in the liver substance, having stellate bands of fibrous tissue radiating out from it towards the surface. It is the contraction of these bands which causes the characteristic umbilication. A number of small yellow spots are visible in most growths which correspond to parts undergoing fatty degeneration. These retrogressive changes arise most rapidly in parts removed from the source of nutrition, which is at the periphery of the nodule; the centre, therefore, is most prone to be affected, the cells, of which the growth in great measure consists, undergoing fatty changes and resorption. The stroma may also participate in the degeneration. The absorption occurs only when the nodule is superficial, when the side towards the peritoneum can sink in and give rise to the phenomenon of umbilication. At this stage, if the growth be cut into, we find nothing but the cicatrix left after the removal of the cells. When the nodule is more deeply situated and surrounded on all sides by a stratum of uniform thickness and rigidity, cancerous abscesses are formed as a result of the degeneration (*Geschwulstwand*).

Another form of degeneration which these growths, more particularly the larger ones, undergo, is the cheesy variety. The cancer masses in this case become dry and hard, and the cut surface appears of a yellowish-grey tint; the cells and stroma both participate in the process; the vessels are destroyed; the whole mass being ultimately transformed into a finely granular detritus.

In the earliest stages of the disease the liver is seldom increased in size, or altered in form, although it contains a large number of cancer nodules of small size; however, as these become more numerous, and especially as they increase in size, the organ undergoes great alterations in shape, volume, and weight, becoming enlarged, much thickened, and enormously increased in weight; indeed, sometimes the liver weighs from 20lb. to 25lb. in such cases. On section very little of the normal parenchyma is found to remain, which as a rule shows no mor-

bid change or sign of compression; the branches of the portal vein are often found filled with cancerous emboli; they lose themselves in the nodules, thus rendering it very difficult to say with certainty whether the nodule is the result of the emboli found in the vessels, or whether the diseased condition of the vein is itself secondary to the cancer growth, unless indeed the small branches of the portal vein containing emboli are continuous with the gastric and portal veins arising in the vicinity of a cancerous growth of the pylorus, and they themselves contain emboli of a malignant character. The walls of the gall-bladder and the lymphatic glands lying in the portal fissure are likewise affected with cancer.—*Lancet*, Sept. 16, 1882, p. 433.

10.—ON PAGET'S DISEASE OF THE NIPPLE.

By T. M'CALL ANDERSON, M.D., Professor of Clinical Medicine in the University of Glasgow.

It is of the utmost importance to come to a definite conclusion with regard to "Paget's disease of the nipple"—whether, as Sir James himself believed, the disease is at first of the nature of eczema, and ultimately terminates in cancer of the breast, or whether it is of a malignant nature from the outset—as the treatment, of course, must vary according to the view which we adopt. The problem is more difficult than at first sight might appear, especially as the affection is more likely to come under the notice of the physician in its early, and of the surgeon in its later, stages; and that comparatively few medical men are sufficiently versed in the diagnosis of skin affections to enable them to discriminate with any degree of certainty between cases of eczema and affections which closely simulate it.

A consideration of the cases which we have ourselves observed, as well as a perusal of the literature of the subject, leads to the following conclusions:—

In persons predisposed to cancer, any local irritation may determine an outbreak of the disease at the part irritated; thus we have frequently seen an undoubted syphilitic disease of the tongue followed by cancer of that part, as the result of the long continued irritation; and just in the same way it is possible for a simple eczema of the breast to prove the exciting cause of, and to be followed by cancer of the mammary gland. But if we exclude these exceptional cases, we can arrive at no other opinion than that "Paget's disease of the nipple," is from the first of a malignant nature, and bears a somewhat similar relation to cancer of the breast that the so-called tylosis (or psoriasis) linguæ does to epithelioma of the

tongue. This opinion is supported by the microscopic examination of the diseased structures made by Dr. Thin and others. That gentleman "believes that the evidence points to a slowly advancing cancerous change near the mouths of the lactiferous ducts, which at a very early stage leads to irritative effects in the superficial tissues of the nipple and surrounding skin, and eventually penetrates into the substance of the mammary gland." Such being the case, it is of the utmost importance to distinguish true eczema of the breast from "Paget's disease of the nipple," towards which the following table may be of assistance:—

"Paget's Disease of the Nipple."

1. Occurs especially in women who have passed the grand climacteric.

2. Affected surface, in typical cases, of brilliant red colour, raw and granular looking after the removal of crusts.

3. When grasped between the thumb and forefinger, superficial induration often felt, as if a penny were laid on a soft elastic surface and grasped through a piece of cloth. (Thin.)

4. Edge of eruption abrupt and sharply cut, and often elevated.

5. Very obstinate, and only yields to extirpation or other treatment applicable to epithelioma generally.

Eczema of the Nipple and Areola.

1. Occurs especially in women earlier in life, and particularly during lactation, or in persons labouring under scabies.

2. Surface not so red and raw-looking, and not granular, but often punctated.

3. Soft, and no induration.

4. Edge not so abrupt, and not elevated.

5. Although sometimes obstinate, yields to treatment applicable to eczema.

—*Glasgow Medical Journal*, Oct. 1882, p. 241.

11.—USE OF BOLIVIAN COCA TO RELIEVE THIRST.

By SURGEON-MAJOR T. EDMONSTON CHARLES, M.D., of H.M. Indian Army, Honorary Surgeon to the Viceroy.

[The following very interesting report on the use of Coca as a means of assuaging thirst when troops are marching through a tract of country with a deficient or bad water-supply, was addressed to Sir Joseph Fayrer, as Physician to the Secretary of State for India.]

Having taken refuge here from a blinding snowstorm, the associations of this place of nearly 2000 years, connected with difficult marching, prompt me to bring to your notice a very valuable property possessed by the leaves of the *Erythroxylon coca* of relieving thirst. The very remarkable effects that I have both myself experienced and have observed while experimenting on others have led me to believe that a small ration of this leaf, if served out to bodies of troops marching through a country badly supplied with water, would prove of inestimable comfort to the men, and might even on occasion, enable a General to carry an army across a country otherwise impracticable.

News of the bombardment of Alexandria has not yet reached me, but the rapid march of events places the probability of the despatch of Indian troops to Egypt as an eventuality so near at hand as to justify me in urging the Government to purchase the entire stock of coca-leaf available both in the London and Paris markets, with the view of supplying it to the troops from India. The use of it will not only help the men to do a long day's march where no water is to be had, but save them from the diseases caused by drinking bad water while moving past places with a doubtful supply. Independently of the gain thus immediately within our grasp, I hope the opportunity may not be allowed to slip of making the occasion available for studying the limits within which the leaf may be serviceable to an army in the field, and that the great importance of the question may be urged on both general and medical officers, with the view of encouraging them to make exact observations by means of comparative experiments of different bodies of men under similar circumstances as regards deprivation from water, etc., the one set supplied with coca, and the other marching without. Had our troops been provided with this leaf in Afghanistan, instead of the disaster after Maiwand, our military historians would have had to chronicle a strategic movement to the rear on Candahar. Had the Russian detachment possessed this leaf they would have reached Khiva over the route they were sent to cross, instead of having been forced to relinquish the attempt and retire demoralised, with their ranks thinned by death, in consequence of want of water.

I lately took one guide and three porters with me to the top of Mont Blanc, and supplied each man with five grammes of coca-leaf—that is, nearly eighty grains apothecary's weight. They spent about ten hours on the mountain without a drop of water, and with only a limited supply of wine. Besides the wine, they drank no tea or coffee or other liquid, neither did they use ice or snow. The evidence of these four men is most explicit and unanimous as to the great relief they experienced in

chewing this leaf, and how much easier it rendered the great exertion required of them by assuaging a tormenting thirst. Every climber knows that going up Mont Blanc without water is no new achievement, as wine is the usual drink carried with them on the ascent. The thirst to be endured, however, is ill assuaged by wine, and if the wine is indulged in as often as the promptings of thirst suggest, very undesirable effects on the brain and nervous system follow. Hence the use of coca is hailed as a real help by these men, who have to gain a livelihood by undergoing the sufferings connected with Alpine climbing. I should perhaps mention that besides the thirst caused by cold and altitude, as the latter part of the descent was made under a burning sun, some hours of thirst caused by heat—during which no wine was drunk—afforded me an opportunity of seeing how coca acted, under circumstances not very dissimilar from those under which troops may have to march in Egypt.

I judge it advisable to inform you that I believe the observation as to the thirst-assuaging powers of the Bolivian plant to be an original one on my part. I do so not to make any claim as to priority of having recognised this property in the plant, or to insist on my having been the first to urge its practical application to relieve the necessities of an army in the field, but simply to guard you, should you think it necessary to consult the literature of the subject, from the danger of believing that I overrate the powers of this agent as a thirst-assuager owing to other observers having overlooked the valuable property that I bring to your notice. I may possibly be mistaken in this allusion as to priority, and neither is my reading so extensive nor my memory so retentive as to make me wish to insist on it further than may be necessary to secure for myself a careful hearing on a subject that I consider one of considerable importance to a military surgeon, and one that merits the careful consideration of a military nation. To enable you to make a trial of the leaves without delay, I enclose a small supply. In five minutes the sialagogue effect of the leaves while being chewed will manifest themselves to you, and serve to convince you that you have a drug to experiment with that has few rivals to fear in this direction. By abstaining from fluids during a meal, and having resort to the constant chewing of the leaf for some hours after, you will be able to obtain for yourself personal proof that the craving for water is materially lessened. As the fibre of the leaf becomes disintegrated by the act of mastication, the impalpable powder produced becomes mixed up with the saliva, and is involuntarily swallowed little by little till the entire mass placed in the mouth has disappeared. A few hours' walk on the sunny

side of Pall Mall while chewing the leaf will also be a good test to inspire you with immediate confidence in the quality of the drug to which I beg to solicit your attention.

I have purposely abstained from commenting on the power claimed for this plant of possessing sustaining properties under prolonged exertion. I have not been able to satisfy myself on this point; and, in fact, believe that recorded observations place such effects in an exaggerated light. I consider that we have other agents at our disposal, not only equal, but superior to coca in insuring such results. Although I have accumulated during past years a large personal experience of the effects of coca in enabling women in labour to undergo days of continuous travail without apparent loss of nerve-power, I do not think this a fitting occasion to dwell on this property of coca. For a similar reason I only refer to my having watched its effects given in infusion in relieving the intense headaches of nervous exhaustion, to my having used the drug with good effects to ward off the failure of nerve-power during prolonged fevers, and to enable patients to struggle through the effects of other exhausting diseases. Should you desire information on these points, with the view of employing the drug under other circumstances of military medicine than for the one object for which I transmit to you the present communication, there are, doubtless, many physicians of light and leading both in London and Paris who would be glad to supply you with the necessary information and observations, and to make up for my silence on the points casually alluded to. At the time that the late Sir Robert Christison published an account of his ascent of Ben Nevis while chewing the coca-leaf (vide *Retrospect*, vol. 74, p. 339), the Professor of Botany in Calcutta—Dr. King, if I am not mistaken—was unable to furnish me with a supply of the leaf to experiment with in the Medical College Hospital, as there were no bushes of this plant in the Calcutta Botanical Gardens. He, however, informed me that the shrub grew in the Botanical Gardens in Ceylon. I had no occasion to write to Ceylon for it, however, as it came to my knowledge that the active caterers for the Calcutta drug market had received advices of supplies having left England, and being so near that time would not be gained by writing to Ceylon. I mention this, that should you desire it, a telegram may be sent to Ceylon to strip their bushes for the use of the Indian contingent, that they may have a small supply to land in Egypt with.

As soon as I made up my mind to do some Alpine climbing, I telegraphed from Chamounix to Paris for some coca to experiment with. The firm I selected was that of 'C. Collas, 8, Rue Dauphine,' and they supplied the sample enclosed. Every

large drug firm either has or can procure the leaf both in London and Paris. It is extensively used for the manufacture of coca wine, and also in that of the elixir of coca, with which the wine carte of every well-furnished hotel is supplied, as well as in the composition of many tonic and nerve-invigorating popular remedies. It is the leaf alone that is a thirst-assuager, and no preparation of the drug should therefore be purchased to supplement the leaves. For other medicinal uses the wine may be secured if thought desirable, but the elixir and other preparations in the market are nearly inert, and some of them contain noxious elements.—*Medical Times and Gazette*, Aug. 5, 1882, p. 165.

12.—ON THE INJURIOUS PARASITES OF EGYPT IN RELATION TO WATER-DRINKING.

By T. SPENCER COBBOLD, M.D., F.R.S., Prof. of Botany and
Helminthology in the Royal Veterinary College.

Previously to the date at which the *Times* correspondent stationed at Alexandria called the attention of the British public to this subject (August 12th), I had already prepared notes on the parasitic dangers to which our troops in Egypt might become exposed.

As certain parasites possess a more or less restricted geographical area, it necessarily follows that invaders or temporary residents in foreign lands are themselves apt to be invaded by noxious parasites, more or less peculiar to the country which either duty or pleasure requires them to visit.

Egypt is a grand field for the helminthologist. Not only is that country the head-quarters, so to say, of one of the most dangerous of human parasites, but it swarms with others possessing scarcely less practical importance, whilst it likewise enjoys the distinction of having made us acquainted with parasitic rarities not known to occur in any other part of the world.

Without question, the most dangerous parasite is *Bilharzia hæmatobia*. This parasite was so named by me in honour of Dr. Bilharz, of Cairo, who first discovered it in 1851. A few years later, I detected the same species in a monkey; and since the year 1856, confirmatory discoveries and observations, made both at home and abroad, have very greatly extended, though they have by no means completed, our necessary knowledge of the natural history of the parasite. In this connection, we must signalise the labours of Dr. Prospero Sonsino, whose residence in Egypt enabled him to contribute important facts. It is to Dr. Sonsino that we owe our knowledge of the fact that cattle and sheep are also liable to be infested by *Bilharzia*;

but the species is not the same as that which invades man and monkey. Amongst recent contributions, we also stand especially indebted to the writings of M. Chatin and to those of Drs. Guillemard, Mackie, and Allen.

The Bilharzia is a fluke of the digenetic kind, and therefore requiring a change of hosts. It differs from the sheep-fluke and its allies in being unisexual, the male parasite being the stouter of the sexes. This is an unusual circumstance. Again, the Bilharziæ differ in respect of habitat; for, instead of occupying the liver-ducts and intestinal tract, as most flukes do, they take up their abode within the blood-vessels of the victim. Moreover, their residence within the human host is restricted to the veins, and here chiefly to the vessels belonging to the portal system.

Although the parasites are individually small—the slender females being less than an inch long—the presence of any considerable number of them gives rise to a very formidable malady, which in the worst cases proves fatal. The disorder has received various names; but it is sufficient to speak of it as the endemic hæmaturia of warm climates. Dismissing the clinical aspects of the subject, and viewing it solely as a question of public health affecting European residents and visitors, I may state that I have recently seen six of the officers of the Eastern Telegraphic Company who contracted the disorder in the neighbourhood of Suez. Seven in all (not “about a dozen,” as reported in the *Times*) were thus invalided. I have likewise recently seen another case from Natal. In all of these gentlemen, the immediate cause of the parasitic invasion was the careless drinking of unfiltered water. In the Egyptian cases, infection occurred during shooting expeditions along the banks of the Cairo-Suez Canal. The Mahmoudieh or Sweet Water Canal, in the neighbourhood of Alexandria, is equally with this and other canals a source of parasitic danger.

Thus, all the evidence that we have obtained of a practical sort as to the cause of the endemic, is in perfect harmony with that which has been derived from scientific inquiry. So far as our investigations have been pushed—my own efforts in this direction having been frequent and continuous—it is clear that the natural history phenomena of Bilharzia do not differ in any essential particular from those that occur in ordinary flukes. In short, we have a similar mode of origination, the same rapid growth and development, attended with metamorphosis and likewise a change of hosts. As with other digenetic flukes, the Bilharzia must have its own special cercaria-form; and, arguing from analogy, there can be but little doubt that the cercaria in question is furnished with a style or boring-tooth.

Investigations with the view of determining the ultimate

changes undergone by the larvæ of *Bilharzia* are indeed still wanting. Probably they can only be successfully conducted in infested districts. The negative character of my own experiments with the lower forms or ciliated larvæ is sufficiently explained by the circumstance that the appropriate intermediate bearers were inaccessible to me. I succeeded in hatching out myriads of embryos, and I demonstrated the fact that they were possessed of a highly developed water-vascular system. The subject was fully illustrated in the *British Medical Journal*, July, 1872. Thus far, M. Chatin and others have verified my observations, but beyond this none of us could advance.

Practically, it is of small moment what species of water-snail or other aquatic organism holds the cercaria of *Bilharzia*. Infection may follow as well from the ingestion of the free swimming cercariæ as from swallowing the intermediary bearers. Whichever mode of infection occurs, it comes to the same thing in the end. The fresh water canals hold the molluscan bearers and cercariæ; and the latter, when swallowed, arrive at maturity within the ultimate host—man or monkey, as the case may be. The disorder follows. This being so, it is obvious that simple filtration will, under ordinary circumstances, prove a sufficient protection. The drying or damming up of the Mahmoudieh Canal is not an unmixed evil to the present occupants of Alexandria. It ensures greater freedom from parasitic invasion, and it induces efforts to remedy the evil consequent upon the failure of the ordinary supply of fresh water.

Unfortunately, the *Bilharzia* is not the only obnoxious parasite that gains access to the human body by means of foul drinking-water in Egypt. The next parasite of importance is the *Ankylostoma duodenale*. It belongs to the Strongyle family, and, like most of its congeners, undergoes growth transformations within water or within moist earth. Most probably its development is also accompanied with a change of hosts. If this be so, we must expect to find some species of aquatic insect or some small entomostracan play the role of intermediate bearer. These crustacea abound in all the fresh-water canals. Transferred to the human body, the young ankylostomes, or *Dochmii*, arrive at maturity and become veritable blood-suckers. When in small numbers, their presence may not be so much as suspected; but when several hundreds of them occupy the intestinal canal, they produce what Griesinger has called a progressive pernicious anæmia. How fatal this parasite may prove in other countries than Egypt, was recently shown in the endemic which carried off some of the labourers working at the St. Gothard tunnel. At the time of the outbreak, many

disputes and misunderstandings prevailed concerning the *role* of this parasite. Under the popular title of "tunnel trichinosis," the affection was sadly mixed up with other endemic disorders. Similarly, the blood-letting habits of *Ankylostoma* and *Bilharzia* being liable to produce like symptoms, the two affections were occasionally rolled into one. The matter cannot be further discussed in this place, but I may observe that our knowledge of the geographical distribution of this treacherous entozöon has been greatly extended by the recent observations of Professor McConnell, who finds that the parasite abounds in India. Wherever found, its power for mischief is the same, and its entrance into the human body is through the medium of water.

Another notorious parasite is the so-called *Filaria sanguinis hominis*, but I cannot now enter fully into the question of its importance. I allude to it here for the purpose of introducing Dr. Sonsino's opinion respecting the collective *role* of the three specially obnoxious endemic worms of Egypt. These three species, namely, *Bilharzia*, *Ankylostoma*, and *Filaria*, "concur," he says, "in the production of a large mortality of the natives," and the mischief they thus occasion "is not sufficiently appreciated."

When recently I was invited by the managing director of the Eastern Telegraph Company to draw up a memorandum on this subject, I laid down the following rules for the guidance of their employés.

1. Select for drinking purposes, whenever procurable, either deep well-water, or water from a spring collected at or near its source.

2. Avoid the use of stagnant water of any kind, especially that from tanks or shallow pools.

3. If the only water available for drinking purposes have been obtained from a doubtful source, it must either be thoroughly filtered or boiled; merely straining through muslin or other of the coarser kinds of filter is useless. On excursions or shooting expeditions, a pocket-filter must be carried.

4. Avoid partaking of all salads made with vegetables grown either in market-gardens, or in open situations frequented by natives of uncleanly habits. Lettuces, water-cresses, and other uncooked vegetables, even when they are known to have been cultivated in favourable situations, require to be carefully washed with clean water before use. Only spring-water, well-water, filtered water, boiled water, and distilled water, can be pronounced as absolutely safe. Springs near human habitations are liable to become contaminated.

I believe that the observance of these rules is sufficient to ensure protection; but, since others (whose opinions are also en-

titled to consideration) take a different view of the mode of infection, it is desirable to state the grounds on which an additional precaution has been recommended.

It is supposed by some writers that the young *Bilharziæ* gain access to their victims by perforating the skin; consequently, they would forbid bathing in rivers, canals, and open fresh waters of any kind. Sea-bathing, on the other hand, is very properly encouraged.

There is some ground for the objection raised as to bathing in fresh waters, inasmuch as the larvæ of the common fluke have been known to penetrate the skin and to develop in such situations. These instances, however, are rare, and they merely afford examples of parasitic "straying" from the usual path.

The memorandum above quoted was printed and privately issued to the company's stations on the 29th of last March. With the managing director's approval, these recommendations are now made public.

Lastly, as regards dangers that may arise from external attacks by water parasites, little need be said. Many still hold, and until lately I myself was of the same opinion, that the Guinea-worm or *Dracunculus* enters the human body from without. We owe it to the lamented Russian traveller, Fed-schenko, to be able to state that *dracunculus* requires a change of hosts, and that a species of cyclops is the intermediary crustacean bearer. There is little danger in Egypt from this source. Troops in foreign lands are now uncommonly well protected by clothing; still there are points worth mentioning, especially as, in the heat of a campaign, distress from thirst often compels the brave soldier to drink the filthiest of waters. One remark will suffice. During the invasion of Egypt by Napoleon, the French soldiers were so distressed that many of them threw themselves flat on the ground to drink at the margin of the canals. In this way, their mouths and nostrils were attacked by leeches; the species specially held responsible for these bloodthirsty assaults being that known as the *Hæmopsis Sanguisorba* of Savigny. These free parasites not only attacked the men, but also their horses, camels, and cattle. It has recently being restated that in the expedition of 1799, the French soldiers also suffered from hæmaturia. That such was the fact there can be no doubt, and it is almost equally certain that the disorder was occasioned by the now well known *Bilharzia*. At that time, however, the parasite was entirely unknown. Thus it is both interesting and instructive to observe how modern discoveries and researches throw light upon events that have long become historic, and upon endemic diseases whose essential character was completely misunderstood at the time of their occurrence.—*British Medical Journal*, Sept. 16, 1882, p. 503.

13.—HOUSE DRAINAGE AND VENTILATION OF SEWERS.

By the EDITOR OF THE LANCET.

In a previous article on the Ventilation of Sewers we stated the leading facts and difficulties of what may be termed the close-system, whereby the emanations from fæcal matter are, as it were, collected in reservoirs and laid on, like gas, into our houses; and we took occasion to point out the fallacy of the hypothesis that water-traps must needs prevent the entrance of sewer-gas into house drains. It was not to be expected that our strictures on the system extant and approved would escape the criticism, or fail to call forth the indignant remonstrance, of a certain school of sanitarians and of "sanitary engineers." Curiously enough, these authorities on the subject either fail to recognise the difference between ordinary effluvia arising from recent fæces and "sewer-gas" properly so called, or they confound the two. William Budd made the distinction between the three morbid elements—specific infective germ-matter, the ordinary effluvium of recent fæces, and sewer-gas—typically self-evident. He cited instances in which those members of a particular household who used one closet into which the dejecta of a typhoid patient were thrown contracted the disease; while other members of the same household, who were actually in closer personal contact with the sick person, were unaffected. He gave details of cases in which the inmates of alternate houses, having their drains connected with a common sewer, were attacked; while the intermediate houses in the same row, of which the drains communicated with a different sewer, had clean bills of health so far as the so-called "epidemic" was concerned. He was in the habit of citing cases of this class to illustrate the specific nature of the contagion, and to show that no mere effluvia, however offensive, and no amount of sewer-gas, however noxious, could produce a specific disease like typhoid. Instances of ordinary malaise, and severe gastric disturbance, culminating in gastric fever, or even enteric fever of the non-specific type, wanting in the characteristic affection of the glands and not presenting the typical rose-spots—the "flea-bites without a puncture mark"—of true typhoid, were adduced in proof of the mischief that might be wrought in a household by bad sanitary arrangements, which left it at the mercy of its own domestic dirt and débris. These two classes of evils existed before the sewerage system, and were, and are, dependent on faults which every householder has within his own control, and which he may amend by measures of his own devising and application. It is, however, altogether a different matter when we come to the question of sewer-gas. This is something *sui generis*, and

is the distinct product of the modern system of sewage disposal. It did not, could not, exist in connexion with the old-fashioned cesspools, except when these were disturbed; and, in the nature of things, it was exceedingly unlikely to occur in the defective brick drains of the paulo post present. We are not in the least anxious to say anything apologetic on behalf of the brick-drain system, but truth and progress are concerned in the recognition that there are worse evils accruing to the system of close drain-pipes and "absolutely severed" sewers than ever attached to the system against which the "sanitarians" and "sanitary engineers" of to-day so self-complacently inveigh.

The initial fact in practical house drainage and sewage disposal is that while recent fæcal matter gives off highly offensive effluvia, and old sewage which has advanced far in the process of decomposition *may* be pestilential, it is sewage in the intermediate stage of putrefaction that emits those peculiarly faint and sickly gases which insidiously poison the blood, depress the nerve-centres, and cause the many known and nameless diseases that sap the vitality of the organic tissues and tend to death. Sewer-gas is not a "stink"; it does not, as a matter of fact, commonly attract attention until it has largely accumulated in a building and impregnated its atmosphere, and already poisoned those within it. It is no more a simple effluvium, or fæcal vapour, or gas, than the mist arising from an ordinary swamp is malaria. Concerning the nature and properties of sewer-gas proper, the sanitarian and sanitary engineers are ignorant. It is, therefore, not unnatural that they should bestow their attention almost exclusively on what seems the greater nuisance, and that being misled by the olfactory sense, they not only go astray, but lead those who trust them implicitly into dangers which it is all-important to avoid. Better let the atmosphere of a house be nauseating from the fumes of recent fæces, or pestilential from the fumes of a cesspool, than poison its inhabitants with the demon sewer-gas skilfully laid down by a system of carefully-closed drains. Unfortunately the *savans* of the scientific sewerage school do not believe in sewer-gas as a manufactured product of their well-intentioned but most baneful ingenuity, and the demon is neither exorcised nor destroyed. It is not possible to discuss the sewage question with these gentlemen, because the differences to which we have alluded between the several kinds of nuisance and poison have no meaning for them. They deem them fanciful, and while we are speaking of one thing they are thinking and speaking of another. In short, the confusion is so bewildering that we prefer to leave the controversialists alone. Meanwhile, for plain folk, who simply wish to keep

their health and have clean and habitable homes, we venture to lay down as briefly as possible a few simple rules.

First, all the vapours, gases, or effluvia that arise within a house are amenable to domestic remedies, and these to be effectual must be measures for the removal of causes rather than the mitigation of mere results and effects. No householder has a right to poison his neighbours. If there be an offensive odour in his house, let him trace it to the source from which it springs. The opening of windows, fumigations, the use of chloride of lime, or either of the thousand-and-one "disinfectants," are artifices which can at best only whiten the sepulchre, and help the man who employs them to forget the dead men's bones within. Though he may forget them, they are there still. It is a duty every householder owes to himself, his family, and his neighbours to uproot the cause of a nuisance on his premises. In cases of illness every particle of fæcal matter ought to be destroyed, instead of being simply got rid of. Why should the germs of disease be thrown broadcast into the sewers of a city because the householder who has sickness in his house is too careless or niggardly to spend a few shillings on some really *destructive* agent, which will not merely remove the odour, but disintegrate the morbid germs? We know that carbolic acid in the proportion of one in forty will do this, and there are possibly other agents which will answer the same purpose, though unfortunately nearly all of the vaunted disinfectants are rapidly vapourising deodorisers, whereas what is wanted is not to modify or overpower the "smell"—which is a small matter—but to destroy the organic matter from which the odour arises. True sanitation is a practical virtue, which must begin at home, and if every householder would do his duty within the area of his own castle and domain, it would not matter much to the health of the people what the "sanitary authorities" did with the sewage when once it passed out of the drains.

Second, all the vapours, gases, and effluvia that enter a house from without are dangerous, and those which find their way from the sewers are almost sure to be deadly. It is idle to talk about harmless "sewer-gas." Sewer-gas is always poisonous; its virulence is only a question of degree. Nothing should ever enter a house from a sewer. Questions of dip in drains, of outfall, of disconnected lavatory and bath pipes, both waste and overflow, are important; but it should be distinctly understood that these relate to the house system; and although syphons and traps in a house may act as sentries in the halls and passages of a palace, they should be guards of honour. The safety of the inmates should be secured by external defences and perfect isolation. The only connexion

between the drainage apparatus of a house and the sewers should be of a nature to allow the fæcal matter to pass out, and nothing, whether gaseous or liquid, to enter in. No ordinary trap will exclude the gaseous contents of the sewers. The heated atmosphere of a house will draw sewer-gas through any trap or system of traps, any distance and at any level. Nothing short of a disconnecting chamber, itself perfectly ventilated *outside* the house by a pipe carried above the level of the house and all adjacent houses—or, still better, led away to some furnace at a distance from the tenement, where it can be passed through a fire and consumed—will suffice to render the drainage system of a house related to the modern sewerage system complete. In the days of the old cesspools every house was self-contained; the same advantage will probably be restored when the earth system comes to be generally adopted, as sooner or later we are convinced it must be. For the present, however, we are at the mercy of the whole army of householders—not a noble-minded one—unless the connexion between the outfall of our house drains and the sewers is solely one for *exit*; and this, as we have said, cannot be secured except by the construction of a special disconnecting chamber outside the house, itself perfectly ventilated by a pipe which should carry the gases that rise from it completely away.

These two series of assertions may be taken as hints, and if carried into practice they will render the householder secure. With regard to the ventilation of the street sewers, there is only one mode which admits of serious consideration, and that is the construction of pipes or flues above the full height of the houses in the vicinage; and even with this system—which ought to be enforced by Act of Parliament—there will still be some danger, because many of the fæcal vapours, miscalled gases, are heavy, and will rapidly fall. Beyond question, means should be taken to burn off the gases and products of sewage putrefaction in properly constructed furnaces at short intervals in the line of main drainage. The larger sewers might thus be depurated at a very small cost for each district. The great obstacle to progress is that dogged obstinacy which springs from a vested interest in ignorance, or, let us say, in the infinite littleness of that knowledge. When a man *represents* an idea, he naturally thinks it perfect. If it is his own, he regards with jealousy anything that seems likely to jeopardise its popularity and his reputation. This is why the sanitary engineers and the narrow clique of sanitarians who support them feel much aggrieved by the attempt we are now making to bring the principles of sewerage under review. They dislike the reconsideration of a system to which they are committed. We are not so hampered, and have faith in the survival of the

fittest. Submitted to the arbitrament of this inexorable law, we believe the system of sewerage extant will not survive the ordeal of a scrutinising judgment.—*Lancet*, June 10, 1882, p. 958.

DISEASES OF THE NERVOUS SYSTEM.

14.—ON THE SYSTEMATIC TREATMENT OF HYSTERICAL AND NEURASTHENIC DISEASES.

By W. S. PLAYFAIR, M.D., F.R.C.P., Professor of Obstetric Medicine at King's College.

I do not propose to occupy your time with any long description of the forms and symptoms of hysterical disease to which the treatment is applicable, or to their pathology. No study could be more interesting, but the time at my disposal is altogether insufficient for such a task. I shall, therefore, content myself with a very brief outline sketch of the typical instances of neurasthenic disease in which systematic treatment is of most use, and follow this by an equally short sketch of what that treatment consists. And I must beg my hearers to remember that I cannot enter into any but the most elementary details on both these topics, for a fuller account of which I must refer them to the writings of Weir Mitchell, and Goodell, as well as to my own former papers. I may say here that while the latter were entitled "The Systematic Treatment of Nerve-Prostration and Hysteria connected with Uterine Disease," this was chiefly because my attention was first directed to the subject in consequence of the frequent association of these states with disease of the reproductive organs in the female. It would be a great mistake, however, to conclude that there is any necessary or constant connection between the two. Indeed, although very frequently the nerve-state has originated in connection with uterine disease, in a large proportion of the cases I have seen, it has completely overshadowed the originating local disorder. I am not sure that I should not, in common honesty, make the somewhat humiliating confession that in many instances over much and injudicious local treatment has, in my opinion, at least intensified, and kept up the now dominating neurasthenic disorder, as in a case under my care as I write, in which the patient may fairly be said to be suffering from pessary on the brain—so incessantly is she thinking of one or other of the seventy-nine different instruments which she has had inserted in the last few years in America and in this country.

It is, perhaps, superfluous to recall to your minds the extremely varying and complex forms of the neurasthenic diseases, which

may be fairly classed under the heading I have selected for this communication. Still I think it likely that it is only those medical men who have paid special attention to this subject, and who have had opportunities of watching cases of this description, that have properly realised how multiform, strange, and misleading these nervous diseases really are. As a matter of fact, probably no two cases are ever precisely alike, and every individual instance calls for the most careful and minute study, if we are to hope for a successful result in its management, not only of its physical symptoms, to make sure that we do not confound real but obscure organic lesion with simple functional disorder, but also of the special mental character of the patient, since much of our success must depend on a judicious reading of this, and on our tact in dealing with it. Anyone who attempts to treat such diseases without careful study of the psychological characteristics of each individual patient, will inevitably fail.

The type of case best adapted for systematic treatment is, in my experience, the worn and wasted, often bedridden woman, who has broken down, either from some sudden shock, such as grief, or money losses, or excessive mental or bodily strain. At first, perhaps, there may have been only a debility, constantly, however, on the increase, daily more and more yielded to, until at last all power of effort is lost, fostered, too often, by injudicious sympathy, and the constant nursing of devoted relatives and friends. Coincident with this is the total loss of appetite, the profound anæmia, and the consequent wasting of the tissues, so characteristic of these cases. On the soil so prepared are often developed the graver protean forms of hysterical disease, such as paresis, or paralysis, vomiting, disorder of motion, hystero-epilepsies, and many others which constitute the despair of the physician, and which must be more or less familiar to all of you. Such, in endless variations, are the cases which those of you who have attempted to cure them by ordinary medication will, I am sure, admit to have given unsatisfactory results, and caused more disappointment than almost any other in your practice.

Now, the principal elements in the systematic management of these cases are :

1. The removal of the patient from unhealthy home-influences, and placing her at absolute rest ;

2. The production of muscular waste, and the consequent possibility of assimilating food by what have been called "mechanical tonics ;" viz., prolonged movement and massage of the muscles by a trained shampooer, and muscular contractions produced by electricity ;

3. Supplying the waste so produced by regular and excessive

feeding, so that the whole system, and the nervous system in particular, shall be nourished in spite of the patient.

On each of these I shall offer one or two brief observations.

1. The removal of the patient from her home-surroundings, and her complete isolation in lodgings with only a nurse in attendance, is a matter of paramount importance. This is a point on which I am most anxious to lay stress, since it is the great crux to the patient and her friends; and constant appeals are made to modify this, which I look upon as an absolute *sine quâ non*. I attribute much of the success which I have been fortunate enough to obtain in my cases to a rigid adherence to this rule. In almost every instance of failure in the hands of others of which I have heard, some modification in this rule has been agreed to, in deference to the wishes of the friends; as, for example, treating the case in one room by herself in her own house, or in admitting the occasional visits of some relatives or friends. While, however, the patient is to be rigidly secluded, it is incumbent to secure the attendance of a judicious nurse, with sufficient intelligence and education to form an agreeable companion. To shut up a refined and intellectual woman for six weeks with a coarse-minded stupid nurse, can only lead to failure. I have had more difficulty in obtaining suitable nurses, sufficiently firm to ensure the directions being carried out, and yet not over-harsh and unsympathetic, than in any other part of the treatment. Whenever my case is not doing well, I instantly change the nurse—often with the happiest results. In addition to the isolation, the patient is put at once to bed, to secure absolute rest. In many cases, she is already bedridden; in others, there has been a weary protracted effort, and the complete repose is in itself a great gain and relief.

2. Under the second head comes systematic muscular movement, having for its object the production of tissue waste. This is administered by trained rubbers, and here again is a great practical difficulty. The so-called professional rubbers are, in my experience, worse than useless, and I have had to teach *de novo* a sufficient number of strong, muscular young women; and the aptitude for the work I find to be very far from common, since a large proportion of those I have tried have turned out quite unsuited for it. I cannot attempt any description of this process. I need only say that it consists in a systematic and thorough kneading and movements of the whole muscular system for about three hours daily, the result of which at first is to produce great fatigue, and subsequently a pleasant sense of lassitude. Subsidiary to this is the use of the faradic current for about ten to twenty minutes, twice daily, by which all the muscles are thrown into strong contraction,

and the cutaneous circulation is rendered excessively active. The two combined produce a large amount of muscular waste, which is supplied by excessive feeding; and, in consequence of the increased assimilation and improved nutrition, we have the enormous gain in weight and size which one sees in these cases, it being quite a common thing for a patient to put on from one to two stones in weight in the course of five to six weeks. The feeding, at regular intervals, constitutes a large part of the nurse's work. At first from three to five ounces of milk are given every few hours; and for the first few days the patient is kept on an exclusively milk diet. By this means dyspeptic symptoms are relieved, and the patient is prepared for the assimilation of other food. This is added by degrees, *pari passu* with the production of muscular waste by massage, which is commenced on the third or fourth day. By about the tenth day the patient is shampooed for an hour and a half twice daily, and by this time she is always able to take an amount of food that would appear almost preposterous, did not one find by experience how perfectly it is assimilated, and how rapidly flesh is put on. It is the usual thing for patients to take, when full diet is reached, in addition to two quarts of milk daily, three full meals, viz.—breakfast, consisting of a plate of porridge and cream, fish or bacon, toast and tea, coffee, and cocoa; a luncheon, at 1 p.m., of fish, cutlets or joints, and a sweet, such as stewed fruit and cream, or a milky pudding; dinner at 7 p.m., consisting of soup, fish, joint and sweets; and, in addition, a cup of raw meat soup at 7 a.m. and 11 p.m. It is really very rare to find the slightest inconvenience result from this apparently enormous dietary. Should there then be an occasional attack of dyspepsia, it is at once relieved by keeping the patient for four and twenty hours on milk alone.

Such is a brief outline of the method to which I am here to direct your attention. As to the results, I have already published several remarkable illustrative cases, so that it is perhaps not necessary to do much more in this direction. I may say, on looking back at my cases, that the only ones with which I have any reason to be disappointed are those in which the primary selection has been bad; and in the few in which the results were not thoroughly satisfactory, I had doubts as to their suitability for the treatment, which I expressed beforehand. These include one case of chronic ovarian disease, and one of bad antelexion with fibroid enlargement of the uterus, in both of which the local disease prevented any really beneficial results. In a third case, I had to stop the treatment in a week, in consequence of cardiac mischief; two others were cases of positive mental disease; and in one case there was true epilepsy. I

have no doubt that any positive co-existent organic disease of this kind should be considered a contraindication. In my other cases, the results have been all that could be wished, and in many of them the patients have been restored to perfect health after having been helpless bedridden invalids for years; in one case twenty-three without ever putting a foot to the ground, in others sixteen, nine, six, and so on. In two instances my patients were in such a state, that it was found absolutely impossible to move them except when anæsthetised; and they were brought to London by their medical men long distances under chloroform, in each case leaving in six weeks perfectly cured. I am not desirous of occupying your time by long details of cases, having already published several; but, as many of my hearers have probably not seen my former papers, I shall conclude by a short notice of some of my recent cases, which will illustrate the classes of disease in which this method is so useful; and I select them not only for their own interest, but because the uselessness of all ordinary treatment in such conditions is proved by the fact that I have with regard to each of them a list of their former medical attendants, amounting in one to no fewer than twenty-five in number, and including the names of many of the most eminent consultants in the country, of itself a sufficient proof that all that the most advanced medical knowledge and skill could do had been tried in vain.

Case 1.—On the 24th of April last, I was consulted on the case of a young lady from the North of England, suffering from intense hysterical vomiting. This had commenced six years previously, after severe mental strain. Latterly, she could keep nothing but a single mouthful of milk on her stomach, and this only when mixed with whiskey, so that in this way she was taking three to four glasses of spirit daily. She was terribly emaciated, weighing only 4st. 7lbs. Her mother wrote of her, “it is just five years last Christmas-day since she has ever retained a single meal. Her symptoms have been most distressing, and have resisted every kind of treatment. Her young life has been completely blighted, and I have long since given up her case as quite hopeless.” The rapidity of the cure, in this instance, was almost ludicrous. In three days after she was isolated, she was keeping down two quarts of milk, it is needless to say no longer with the aid of whiskey. In ten days she was eating with an enormous appetite, and in six weeks she left town weighing 7st. 8lbs., a gain of 3st. and 1lb., and has since remained quite well.

Case 2.—The next case is illustrative of the evil effects of over much education and mental strain, in a clever girl of highly developed nervous organisation. It was placed under

my care by the advice of one of our most eminent metropolitan physicians, who had been seeing her frequently in consultation with her own medical attendant for several years, and besides him many other physicians, equally eminent, had been consulted. This young lady was seventeen years of age. At the age of fourteen, when working, she had suddenly broken down, got complete hysterical hemiplegia, and for four years had never been out of bed or moved either of her lower limbs. In addition, she had a loud barking cough, which could be heard all over the house, and which had resisted every kind of medication. No food could be taken beyond milk, and a biscuit, and an orange. This case was placed under my care as a sort of test, and I was particularly anxious that it should turn out well. As to the result, I need only say that, at the end of a month I drove her out in my carriage, dropped her at the top of the street in which she lived, and made her walk down to pay her parents a visit. She has since remained perfectly well. It was a curious and characteristic point that her cough, which had resisted for years all sorts of energetic treatment at home, entirely ceased forty-eight hours after she was removed, and was never again heard.

Case 3.—The next instance is one out of many of the same sort I have had under my care, and is a typical example of the kind of case best suited for this treatment. In this, there was no definite illness, no simulated disease, as in the last lady, but a general and complete break down. Her medical man sent her to me with the following note. "She has all her life been an invalid, with no well-defined symptoms; sometimes headache and nausea; at others spinal irritability, giddiness, etc. In fact, she is a typical hysteric or neuralgic patient. She never stirs out of the house, or moves from her bed or sofa, eats next to nothing, and is never happy unless seeing a doctor or taking physic." I found, as was to be expected, that this young lady was wasted to a skeleton. Her chief complaints were nausea, headache, backache, intense nervous depression, and timidity (so that she was unable to speak to a stranger), and absolute anorexia; skin dry and rough; menstruation irregular; entirely dependent on chloral and morphia for sleep. She was twenty-nine years of age, and for nine years had been entirely on her back. I need say no more about this case, than that it was as successful as the rest of the same type I have had to deal with, any one of which I might have selected as an illustration. In six weeks, she was walking about; in two months, she started on a sea-voyage with her nurse, with directions that she should be forced to mix as much as possible with the passengers, to overcome her dread of society. Only two days ago, she came to report her-

self to me, having travelled alone from the country by rail ; and I positively did not at first recognise her—so different was the well-dressed, healthy-looking woman, from the wretched invalid of a few months ago. She tells me that she now plays tennis ; goes out to picnics and parties ; and enjoys life like anyone else.

Case 4.—The last example with which I shall trespass on your patience, I am tempted to relate, because it is one of the most remarkable instances of the strange and multi-form phenomena which neurotic disease may present, which it has ever been my lot to witness. The case must be well known to many members of the profession, since there is scarcely a consultant of eminence in the metropolis who has not seen her during the sixteen years her illness has lasted, besides many of the leading practitioners in the numerous health-resorts she has visited in the vain hope of benefit. My first acquaintance with this case is somewhat curious. About two months before I was introduced to the patient, chancing to be walking along the esplanade at Brighton with a medical friend, my attention was directed to a remarkable party at which everyone was looking. The chief personage in it was a lady reclining at full length on a long couch, and being dragged along, looking the picture of misery, emaciated to the last degree, her head drawn back almost in a state of opisthotonos, her hands and arms clenched and contracted, her eyes fixed and staring at the sky. There was something in the whole procession that struck me as being typical of hysteria, and I laughingly remarked, “ I am sure I could cure that case if I could get her into my hands.” All I could learn at the time was, that the patient came down to Brighton every autumn, and that my friend had seen her dragged along in the same way for ten or twelve years. On January 14th of this year, I was asked to meet my friend Dr. Behrend in consultation, and at once recognised the patient as the lady whom I had seen at Brighton. It would be tedious to relate all the neurotic symptoms this patient had exhibited since 1864, when she was first attacked with paralysis of the left arm. Among them—and I quote these from the full notes furnished by Dr. Behrend—were complete paraplegia, left hemiplegia, complete hysterical amaurosis, but from this she had recovered in 1868. For all these years she had been practically confined to her bed or couch, and had not passed urine spontaneously for sixteen years. Among other symptoms, I find noted, “ awful suffering in spine, head, and eyes,” requiring the use of chloral and morphia in large doses. “ For many years she has had convulsive attacks of two distinct types, which are obviously of the character of hystero-epilepsy.” The following are the brief notes

of the condition in which I found her, which I made in my case-book on the day of my first visit. "I found the patient lying on an invalid couch, her left arm paralysed and rigidly contracted, strapped to her body to keep in position. She was groaning loudly at intervals of a few seconds, from severe pain in her back. When I attempted to shake her right hand, she begged me not to touch her, as it would throw her into a convulsion. She is said to have had epilepsy as a child. She has now many times daily, frequently as often as twice in an hour, both during the day and night, attacks of sudden and absolute unconsciousness, from which she recovers with general convulsive movements of the face and body. She had one of these during my visit, and it had all the appearance of an epileptic paroxysm. The left arm and both legs are paralysed, and devoid of sensation. She takes hardly any food, and is terribly emaciated. She is naturally a clever woman, highly educated, but, of late, her memory and intellectual powers are said to be failing."

It was determined that an attempt should be made to cure this case, and she was removed to the Home Hospital in Fitzroy Square. She was so ill, and shrieked and groaned so much on the first night of her admission, that next day I was told that no one in the house had been able to sleep; and I was informed that it would be impossible for her to remain. Between 3 p.m. and 11.30 p.m., she had had nine violent convulsive paroxysms of an epileptiform character, lasting, on an average, five minutes. At 11.30 she became absolutely unconscious, and remained so until 2.30 a.m., her attendant thinking she was dying. Next day, she was quieter, and from that time her progress was steady and uniform. On the fourth day she passed urine spontaneously, and the catheter was never again used. In six weeks, she was out driving and walking; and within two months she went on a sea-voyage to the Cape, looking and feeling perfectly well. When there, her nurse, who accompanied her, had a severe illness, through which her ex-patient nursed her most assiduously. She has since remained, and is at this moment in robust health, joining with pleasure in society, walking many miles daily, and without a trace of the illnesses which rendered her existence a burden to herself and her friends.

In conclusion, I may remark that it seems to me that the chief value of this systematic treatment, which is capable of producing such remarkable results, is, that it appeals, not to one, but many influences of a curative character. Everyone knew, in a vague sort of way, that, if an hysterical patient be removed from her morbid surroundings, a great step towards cure is made. Few, however, took the trouble to carry this knowledge into practical action; and when they did so, they

relied on this alone, combined with moral suasion. Now, I am thoroughly convinced that very few cases of hysteria can be preached into health. Judicious moral management can do much; but I believe that very few hysterical women are conscious impostors; and the great efficacy of the Weir Mitchell method seems to me to depend on the combination of agencies which, by restoring to a healthy state a weakened and diseased nervous system, cures the patient in spite of herself.—*British Medical Journal*, Aug. 19, 1882, p. 309.

15.—ON URARI AS A REMEDIAL AGENT IN TETANUS.
By Dr. LESLIE MATURIN, Physician to Kilmainham Fever Hospital.

Within the past few years considerable progress has been effected in the treatment of nervous affections, based in some instances upon our extended knowledge of their pathology, and in others, where their anatomical origin is unknown or obscure, by the empiric exhibition of certain remedies which experience alone proves to be possessed of specific effects. The treatment of tetanus, however, is an exception. Numerous medicines have been extolled, and lately surgical procedures adopted, but the results have been in the majority of cases disappointing. The great number of proposed remedies bears in itself sad witness to their inefficacy, and having tested them all, we are still obliged to confess that science has not yet discovered any specific for this terrible malady. Certain cases, particularly chronic ones, recover, and might probably recover without any treatment, and the recoveries are attributed to the remedies adopted; but similar medication resorted to by others, though carried out in every detail, or even in the hands of its originators, has not on subsequent occasions verified their expectations.

I feel impelled to publish the annexed observations on a case of tetanus treated by the hypodermic injection of urari on the following grounds. We are almost unacquainted with the effects of urari upon the human subject. We are in complete ignorance to what extent the drug may be safely administered, or in what doses, short of toxic ones, it may exhibit a therapeutic action. Its well-known properties as an acinetic peculiarly suggest its administration in this disease. Lastly, the notorious fatality and terrible suffering induced by tetanus fully warrant its exhibition, even were the certainty of benefit disproportionate to the risk incidental to the administration of so dangerous a remedy.

Urari, or as it may perhaps be better known by its synonymes curara, woorara, wourali, and ticunias, appears to be a combina-

tion of vegetable drugs, used by the Indians of tropical America for the purpose of poisoning their arrows. That portion of the compound upon which its poisonous principle evidently depends is the juice of the strychnos vine, of which two species are used, which belongs to the natural order of Loganiaceæ and the sub-family of Strychniæ (Jussieu). It is prepared for use by mixing it with pepper, coque-du-levant (*Animirta coccullus*), and other acrid plants. The quality of urari is variable, but the poisonous principle is permanent even when exposed to the atmosphere for a long time. I am informed that the South American Indians, who mix the drug with a glutinous substance to cause its adherence to the points of their arrows, manufacture a large number at once, clearly indicating that the poison is not rendered inert by time, and that it retains its activity when scraped off the arrows which have been imported into this country. When taken internally urari possesses no poisonous properties, differing in this respect from the strychnos tieuté, a decoction of which, called tjettek, is used by the Javanese for a similar purpose, and in its permanency, from the juice of the upas with which the natives of Borneo poison their arrows, and which retains its active properties for only a few hours. The urarised arrows, or, more properly speaking, darts, are very slender, unfeathered, about ten inches in length, and are blown from a hollow reed about five or six feet long. They are principally used in hunting, the barbed heads being fitted into a socket in the point, this arrangement being adopted so that, in the event of the shaft being broken or shaken off by the wounded animal, the barbed point remains in the wound, the shaft being subsequently fitted with another head. The Bornean natives and Javanese also impel their arrows from a reed. The Bosjesmans of Southern Africa lethalise their arrow heads with the secretion of the poison glands of the puff-adder and cerastes, and also with the larva of a small beetle called N'gwa by the natives, of which Livingstone gives a very graphic description. Their arrows are shot from bows, both bow and arrows being very slender. The Malayan kris or dagger is said to be poisoned by being plunged into a decomposed human body or into the stem of the pine-apple. The knife is fluted by the action of acids to retain this rather uncertain poison in its grooves.

The medicinal employment of urari is not novel. So far back as 1856 M. Vella administered it at Turin in three cases of acute traumatic tetanus supervening respectively four, five, and three days upon operation for gunshot injuries. The first two cases terminated fatally; the third recovered, the spasms ceasing upon the twelfth day subsequent to its administration. He employed it locally in the form of compresses to the wounded part, of the

strength of two grains to the ounce, increased to twenty grains to nearly three ounces. It produced no irritation. M. Chas-saignac, in 1859, used it in a similar case, of a strength of 20 centigrammes in 120 grammes of fluid, as a lotion applied to the wound by plugs of lint renewed every two hours. He also administered it internally in the same case, ten centigrammes in one hundred grammes of liquid, one drachm every two hours. He was evidently unaware of its inertness when taken by the mouth. M. Follin at the Hôpital Necker exhibited it hypodermically without success in a case of traumatic tetanus occurring on the eighth day, ten drops of a solution of one part in one hundred, increased to twenty-four drops, being injected every half hour. He says its administration was productive of no benefit. Gerhardt states that 50 per cent. of adult cases treated by urari recover, but he gives no statistics of the numbers treated, nor whether they were acute or chronic cases. If this be so, and if his percentage is framed upon a large number of cases, the outlook is hopeful for the employment of the drug in this country. He fixes the dose at from one-half to one-third of a grain in children. On the other hand, Demme regulates the quantity at from one-tenth to one-fifth of a grain in adults. Niemeyer recommends larger doses, ranging from one-eighth to one grain and a half. It has been proposed, to ensure a more uniform strength, to inject the active principle, curarina, but I am not aware of any recorded instance of its adoption.

Urari has been used on more than one occasion in England in the treatment of nervous affections. Mr. Alfred Simson and Dr. D. Drummond have adverted to its employment in 1878. I find a case reported in which it was injected to the amount of two-fifths of a grain for several days in succession in a case of chorea with an apparently curative result. At Manchester in 1878 it was injected in a case of hydrophobia without success. Four doses of one-fourth of a grain each were injected in ten hours. In 1876 Mr. Arthur E. Durham injected it in doses from three-hundredth to one-hundredth of a grain at intervals of two hours for seven days in a case of traumatic tetanus admitted into Guy's Hospital. The patient, a boy of fourteen years, recovered, but other treatment—morphia, eserine, and conium—was also combined, so that it is difficult to ascribe the successful result to the action of urari alone. The case was also a chronic one, not occurring until twenty days from the receipt of injury, such recoveries being by no means infrequent. I believe the drug may be used in much larger quantities than has been adopted in these cases. Children may be more, but but are in all probability less, tolerant of the poison than adults; and with the former Gerhardt fixes the doses at from one-half to one-third of a grain. As may be seen by the appended case,

however, a more marked diminution of the spasms followed the exhibition of small than of larger doses, the former being repeated at shorter intervals.

The action of urari is transitory, and seems to be exercised upon the motor nerves only, the sensory remaining unaffected. When pushed to its toxic extent, paralysis of the voluntary muscular system follows, and death ensues from paralysis of the respiratory muscles. I well remember assisting at an experiment, in which I sustained the action of the heart in a rabbit for nearly two hours by artificial respiration by means of a tube tied into the trachea. In tetanus the voluntary muscles are violently convulsed; they are in a true state of cinesia, resembling that artificially produced by strychnia. Is it not rational to infer that an agent which induces an opposite condition—that of acinesia—should be antagonistic to it? May it not be possible to induce a partial acinesia, to diminish the excitability of the spinal cord by urari, without pushing it to the extent of producing paralysis; or perhaps even justifiable if, by establishing that condition, we might overcome this hyper-irritability of the cord, knowing that in artificial respiration we might still hold the reins of life in our hands? Might we not, perhaps, adopt this ultra treatment as a *dernier ressort*, where a certain and terrible death stares the sufferer in the face?

J. C., dairyman, aged seventeen years, was admitted into Kilmainham Fever Hospital under my care, 27th November, 1881, suffering from a rather mild attack of acute articular rheumatism. He was a well-nourished healthy boy, of sober habits, living much in the open air of the country, his business being to milk the cows and drive the milk-cart in and out of town morning and evening. I put him on 15-grain doses of salicylate of soda every two hours, and the affected joints—the knee of one side and both ankles—were enveloped in cotton-wool and gutta-percha tissue. On the morning of the 29th of November he complained of stiffness in the jaws and neck, the former of which I attributed to the maxillary articulation becoming affected. On the morning of the 30th, when going round the hospital I was struck by the appearance of his face. The forehead and eyebrows were corrugated, and the angles of the mouth retracted, and on requesting him to open his mouth, the effort to do so produced a most characteristic tetanic grin. The head was drawn back, the sternomastoid and muscles of the back of the neck were very tense, and on placing my hand on his knee a spasm ensued, which left no doubt as to the nature of the case. Upon examination I found an abrasion about the size of a florin on the dorsum of the left foot, a little below the bend of the ankle; it was

covered with a dry crust, on lifting up which a small quantity of pus exuded, and a raw granulating surface was exposed. He said he had been dancing hard two nights previous to admission, and that a new boot which was too tight had blistered him. While examining him another spasm occurred. He was perspiring profusely, and the knee and ankles were slightly swollen, but he said the pain was much diminished. I had him immediately removed into a small carpeted ward, by himself; a strong light was excluded, and a uniform temperature of 65° Fahr. maintained throughout the entire treatment. The salicylate of soda was discontinued in the evening, as he made no complaint of pain in the joints; the pharmacopœial enema of assafoetida was administered and an ice-bag applied along the course of the spine. During the day the spasms became very frequent. He took his food well, and his spirits were good. At 12 o'clock p.m. I administered a hypodermic injection of one-twentieth of a grain of urari.

1st December. Passed a very restless night. The body was bathed in perspiration, the jaws tightly clenched, strongly marked opisthotonos, the head retracted, and the back being curved until the spine of the scapula was approximated to within fourteen inches of the nates. This condition was tonic, with no remissions, the trunk being as rigid as a block of wood; the risus sardonicus and corrugation of the facial muscles were very typical. The muscles of the abdomen (the recti especially) were very tense and hard, and during the spasms—owing to their greatly extended condition, induced by the opisthotonos—I was in great apprehension of their becoming ruptured. The diaphragm and laryngeal muscles did not seem affected, and his breathing was regular. The toes of both feet were strongly extended, the extensor tendons being very tense. His agony was most painful to witness. He lay upon his side with a pillow in the hollow of his back for support, and he earnestly begged to be changed from side to side every three or four minutes, each change inducing a spasm. The sweating during the day was profuse. He took his food and eight ounces of wine, deglutition being performed slowly and with difficulty. I ordered the frequent change of position to be discontinued, on account of the spasms set up by it. The tongue was much bitten, and the odour of the breath very offensive, from the retained blood, saliva, and particles of food. Ordered a gargle of chlorate of potassium. During the day the spasms were very frequent; from 7 to 12 o'clock p.m. he had 38—equivalent to 8 in the hour, or about 1 every 7 minutes. Morning temperature, 98.3° Fahr.; evening, 99.6° Fahr. At four o'clock a.m. I administered $\frac{1}{10}$ grain of urari; at 10 a.m. and at 2, 6, and 11 o'clock p.m. $\frac{3}{20}$ grain on each occasion. The introduc-

tion of the needle at no time during the entire case produced a spasm.

2nd. Dozed during the night, in the intervals of the spasms. Opisthotonos as marked as on preceding day; still sweating freely. Ordered soup and water enema, which acted well; complained less of pain in the back; breathing natural. At 3.30, 9.30 o'clock a.m., 1.30 and 5.30 o'clock p.m. $\frac{3}{20}$ gr., and at 12 o'clock p.m. $\frac{1}{5}$ gr. urari injected. 140 spasms during the 24 hours—equivalent to about 6 every hour, or 1 in every 10 minutes. Morning temperature, 99.4° ; evening, 99.5° Fahr.; wine increased to 12 ounces.

3rd. Rigidity of the jaws, abdominal muscles, and opisthotonos still extreme; sweating less; deglutition easier; breathing natural. At 4 and 9 o'clock a.m. $\frac{1}{5}$ gr., at 2 o'clock p.m. $\frac{3}{20}$ gr., and at 12 o'clock p.m. $\frac{1}{2}$ gr. urari was injected. At the latter hour I also injected $\frac{1}{2}$ gr. of morphia, as he was very restless and complaining much of want of sleep. He had 90 spasms during the 24 hours, or about 1 in every 15 minutes. Morning temperature, 99.2° ; evening, 99.5° Fahr.

4th. Opisthotonos less; 16 inches between the shoulder-blades and nates; abdominal, neck, and jaw muscles not diminished in tension. Tetanic grin and facial corrugation much less marked. Said he was much easier, and slept well during the intervals of the spasms, of which during the day he had 83, much less violent and of shorter duration than those of preceding day. At 10 o'clock a.m., 2 and 10 o'clock p.m. $\frac{1}{2}$ gr. urari was injected, and $\frac{1}{2}$ gr. morphia at 12 o'clock p.m.; wine increased to 16 ounces. Morning temperature, 98.8° ; evening, 99° Fahr.

5th. Could separate the teeth about half an inch; opisthotonos diminished to 17 inches between the scapulæ and nates; abdominal and neck muscles, and extensors of toes less tense; complained of colicky pains in abdomen. Ordered enema of castor-oil and turpentine, and draught of chloric ether and tincture of opium. At 5 and 11 o'clock a.m., and 5 and 11 o'clock p.m., $\frac{1}{2}$ grain urari injected upon each occasion; 46 spasms during 24 hours, feebler and shorter than those of preceding day, equivalent to 2 in the hour. Morning temperature, 98.8° ; evening, 99.4° Fahr.

6th. Muscular tension about similar to preceding day; spasms very weak and brief; sweating ceased; expression of face almost natural; could separate jaws nearly an inch; distance between shoulder-blades and nates, nineteen inches; experienced great relief from lying on the back, with an air cushion in the dorsal concavity. At 6 a.m., 12 o'clock noon, 6 and 12 o'clock p.m., $\frac{1}{8}$ grain urari injected on each occasion. Had 34 spasms during 24 hours, or about 3 every 2 hours, or 1 every 40 minutes. Morning temperature, 98.8° ; evening, 99° Fahr.

7th. $\frac{3}{4}$ grain urari was injected at 6 a.m., 12 o'clock noon, 6 and 12 o'clock p.m.; 14 spasms, or about 1 in every 2 hours during 24 hours, 20 less than preceding day, feeble, and of short duration. Morning temperature, 98·8°; evening, 99° Fahr.

8th, 9th, 10th, and 11th. 1 grain of urari injected at 6 a.m., 12 o'clock noon, 6 and 12 o'clock p.m. each day. On the 8th, 4 spasms, or 1 in every 6 hours occurred, 10 less than on the preceding day; on the 9th, 2 spasms, or 1 in every 12 hours, 2 less than on the preceding day; on the 10th, 3 spasms, or 1 in every 8 hours, 1 more than on the preceding day; and on the 11th, no spasms occurred. No urari was injected after this date, nor did any more spasms occur. The muscles of the back and jaws gradually relaxed. On the 14th they had regained their normal condition, and on the 18th he was up, and able to sit in an arm-chair at the fire. The muscles continued stiff and weak for a long time, and the patient was discharged from hospital on the 22nd of January, 1882.

We may rationally assume, firstly, that in this case, no other treatment having been adopted or combined, urari seems to exercise a specific action in diminishing the frequency and violence of the tetanic spasms; secondly, that its acinetic properties are not always *immediately* developed upon its absorption, being more marked by comparison of its daily effects than by that of shorter intervals; thirdly, that it is not a cumulative, a sufficiency—nearly half a drachm—having been injected during a period of eleven days to produce a fatal effect, were it so; fourthly, that four grains may, in an adult, be exhibited at intervals in the twenty-four hours without danger to life.

The drug was first employed in the form of discs prepared by Messrs. Savory and Moore, and subsequently as an aqueous solution, prepared by myself, of the commercial urari procured for me by Messrs. Thacker and Hoffe, of this city.—*Dublin Journal of Medical Science*, April, 1882, p. 307.

16.—SOME MEDICAL AND SURGICAL USES OF BELLA-DONNA OR ITS ALKALOID.

By J. H. WHELAN, M.D., M.Ch., Loughrea.

While opium may be called the *prima donna* of drugs, belladonna vies with it, and may be called *bella donna* on its own merits with justice. It is well known to physiologists that belladonna and its alkaloid have the power of doing away with the inhibitory action of the vagus on the heart. Physicians and surgeons seem to overlook the fact that syncopic attacks are in the main caused by reflex cardio-inhibition. Every medical man knows that Mr. Schäfer, of University College,

has recommended the use of atropine *sub cute* before chloroform inhalation, in order to do away with the effects of the vagus stimulation supposed to be caused by this anæsthetic. Yet how very few use it! I do not know of an Irish hospital wherein the practice has been adopted. We must conclude that the surgeons are sceptical of its good effects. Without going deeply into physiology, let me briefly summarise the evidence of cardio-inhibition, its causes, and the effects of atropine.

1. If we send an interrupted current into the exposed vagus of an animal, after an initial latent period (which is $\cdot 16$ second in the rabbit according to Donders), the heart stops beating and remains in diastole.

2. If we give a dose of atropine before applying the electrodes no such thing takes place.

3. The application of muscarine or pilocarpine seems to produce profound cardiac inhibition, which a small dosage of atropine removes.

4. Nicotine slows the heart considerably, but its effect passes speedily off, the heart assuming its normal rhythm. Stimulation of the vagus has then no effect, but the dosage of muscarine at once produces a standstill. It would seem from this that nicotine paralyses the cardio-inhibitory vagal fibres after an initial stimulation, while atropine, which will remove the effects of the muscarine, has an effect to boot on the heart itself—Bidder's ganglia, or whatever it may be.

5. We may stop the beating of a frog's heart by exposing its mesentery, and slapping it with a scalpel laid on the flat, by crushing one of its limbs, or in other ways, all by causing a reflex action.

What do all these, the results of vivisectional experiments, teach us? They teach us what Schäfer told us long ago, that the hypodermic use of atropine before chloroform inhalation may ward off death itself. But I for one do not believe in Schäfer's idea that chloroform stimulates the vagal inhibitory fibres, but incline to the belief that chloroform weakens the heart's action, that it lessens all protoplasmic activity; that when the shock comes in the cutting, &c., of the operation, we have a reflex cardio-inhibition over which the heart is unable to mount in its weakened condition. We need, in truth, have no operation at all, and this is a point to which I would call special attention. In the administration of the drug when the patient is struggling under its influence, an action in the intellectual centres, the supervention of fright, terror, or any strong impulse may cause a like effect, and death. Should the latter supervene we are treated to the oft-told tale of the failure of the heart's action. Evidently these things may occur under all anæsthetics, and are more potent in those that are of a

depressing nature *per se*. They are not specific to chloroform. A dose of atropine would in all cases be a useful preventive, and, perhaps, if adopted in future, save some of our species temporarily from the jaws of our grim-visaged foe.

Turning for a moment from Surgery to her kindred sister, Medicine, there are many cases in which belladonna or its alkaloid would prove useful. In some extreme cases of hysteria or allied disorders we have patients going from one faint into another, frequent syncopic attacks. In the allied abnormal condition of pregnancy, that called by old authors hypothæmia, we have the same condition. In both this drug ought to prove extremely useful. In the former we have impulses originating probably in the higher centres, causing frequent inhibitions; in the latter the less noble organ, the uterus, takes the place of the brain. In certain apparently asthenic inflammations, particularly in peritonitis, a very weak pulse is a common thing. One would imagine that this, which is fast, could in no way be connected with the so-called cardio-inhibitory mechanism, but it is just possible that it might. The inhibitory fibres, being acted on slowly and gradually, become in part exhausted, while the "accelerator" nerves might develop into action. Be this as it may, I once saw a very interesting case under Surgeon Hamilton in the Co. Meath Infirmary. A man was brought in suffering from slight localised abdominal tenderness and obstinate constipation. The pain increased and the pulse became extremely weak and fast, while the constipation increased after the trial of numerous expedients. Surgeon Hamilton ordered him a grain of extract of belladonna every hour. By the time he had taken his second dose the pulse had improved wonderfully, and assumed the normal type in all its characters. The patient ultimately got worse and the pain increased, when he was put on full doses of opium. He died, and the autopsy revealed a perforating ulcer of the pylorus. It is difficult with our present knowledge to interpret this case aright. By what means did the improvement of the pulse occur? Was it by the removal of the cardio-inhibitory action developed reflectorially from the inflamed peritoneum? Some no doubt would refer the action to an influence by which the arterioles were contracted *a la* Burdon-Sanderson's theory of digitalis. But leaving this rather difficult problem, I think we have in the deadly nightshade a means by which we can prevent persons from fainting, so that it is just probable, in the future of society, when a young lady feels inclined to faint, instead of running for the brandy bottle recourse will be had to an atropine parvule.

By the introduction of the nozzle of the hypodermic syringe the surgeon may remove the effects of the shocks of gigantic

wounds of railway accidents, of common wounds on the battlefield, for the primary shock of the latter sweeps away nearly as many men as their secondary consequences. I had once in the days of my studentship to open a small onychial gathering in a girl's finger. She was of an extremely nervous and erotic constitution, but withal strong and well made. About a year or so before she had been an inmate, for over four months, of a public institution—an inveterate case of hysteria. Immediately after the opening of the minute abscess she fainted three times. Some time afterwards I had to remove the stump of a tooth for her; on this occasion she fainted twice. Less than a month afterwards I had to attempt the removal of another. This latter was the most painful and longest ordeal to her, as owing to the friability of the stump it was extremely hard to be got at. I gave her, twenty minutes before using the instrument, twenty-five minims of tincture of belladonna. She did not faint nor manifest any signs of weakness—a result which must, I think, be attributed to the narcotic. If then, as it seems likely, we are in possession of a drug which will prevent cardio-inhibition, cases of “death from shock” ought to fade from the death register of surgical practice. It is perhaps right to state that Ringer and others consider that the paralysing action of atropine on the vagus is no longer tenable, though their ideas for thinking so do not seem clear.

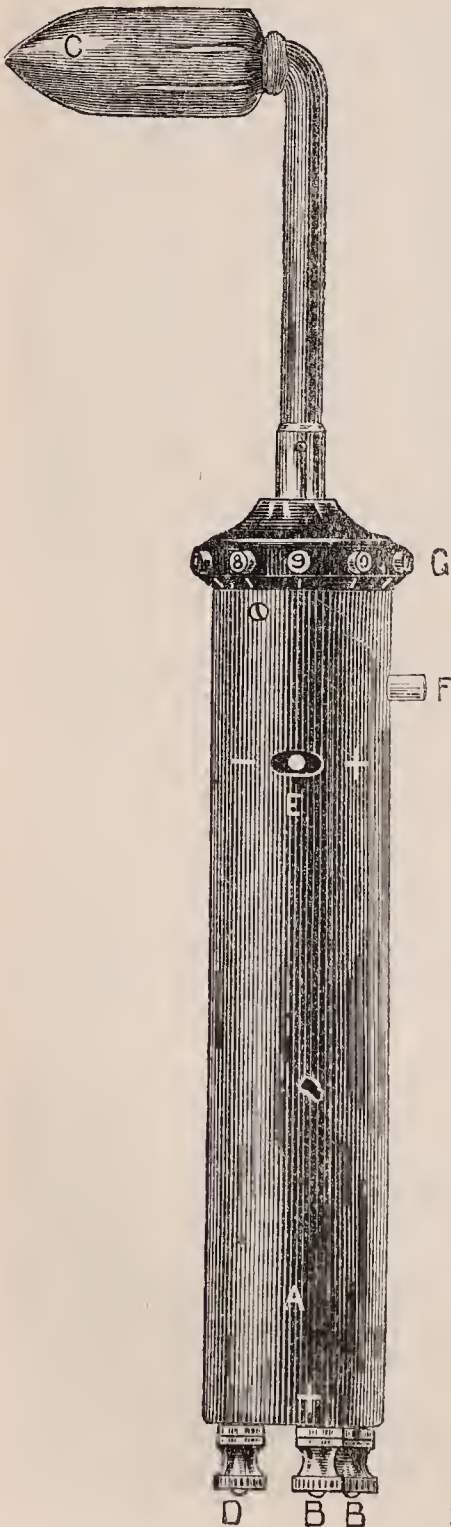
Belladonna is sometimes serviceable in annoying nocturnal emissions. It will be found very useful indeed if the emissions be accompanied with erections, but perfectly useless if they be not so accompanied. This is in keeping with Nicolski's results, that atropine paralyses the “dilator” fibres of the nervi erigentes, while muscarine produces erection apparently by stimulating the local dilator mechanism, thus resembling what appertains to the heart. When therefore we have a case of excessive nocturnal emissions with erections, minute doses of belladonna and bromide of potassium will speedily effect a cure when exhibited at bedtime.

Dr. Gentilhomme of Reims, I see by the late journals, has employed a pill containing one-hundredth of a grain of sulphate of atropine in a patient suffering from coryza, and very subject to it, with very excellent results. Fifteen minutes after the first administration all sneezing had ceased, the secretion stopped, and respiration became normal. Eventually the attacks diminished, and finally disappeared under its influence. If Gentilhomme's conclusions turn out correct, there will be a very decided improvement made in the treatment of catarrh. Dr. G. Johnson's treatment by full doses of opium invariably gives rise to unpleasant sequential symptoms, while Jukes

Styrap's frequent minute doses with antimony are very depressing, to which I can bear personal testimony.—*Lancet*, Sept. 2, 1882, p. 348.

17.—ON A NEW MEDICAL ELECTRODE.

By A. HUGHES BENNETT, M.D., Physician to the Hospital for Epilepsy and Paralysis, Regent's Park.



In the scientific employment of electricity in medicine, and more especially for the purposes of electro-diagnosis, in addition to the currents from different batteries, certain accessories are essential. There must be: 1st. An electrode of suitable size and shape. 2nd. A method of graduating the strength of the current, by means of which the feeblest or the most powerful efforts of the battery may be obtained, or any intermediate grade that may be desired; this, moreover, must be effected gradually, so as to avoid unnecessary sudden changes or shock. 3rd. A means of opening and closing or of interrupting the current. 4th. A mode of alternating or reversing the direction of the current.

Many of the batteries supplied for medical purposes do not possess all these accessories, which are absolutely essential for scientific investigation. Even those which supply these necessities are open to the objection that in delicate diagnostic investigations the attention of the observer is divided between the electrode with which he makes his experiments on the patient and the element-board upon which are placed the different apparatus he has to manipulate. To those practically experienced in electro-diagnostic researches this has always been found to be a serious drawback to the facility and success of their conclusions. In the endeavour to in some measure obviate these difficulties the

instrument has been constructed of which the accompanying woodcut (half-size) indicates the chief features. It consists of an electrode of convenient shape and size, and contains in its interior all the essential accessories above enumerated. A is the handle. BB are two connecting screws, to which are attached the positive and negative poles of the battery. C is a metal or carbon point, covered with wash leather; in the figure this is of a convenient shape for electro-diagnostic purposes, by which either a very fine point or a considerable surface can be applied to the skin; it may be unscrewed, and other heads of different shapes and sizes fixed on as necessity may require. D is a binding screw for the other electrode, which is applied to the patient in order to complete the circuit. E is a lever for alternating the current. When moved towards + the point C is the positive, and when towards - it is the negative, pole. F is a peg which when pressed down closes, and when it moves back by means of a spring breaks the circuit; the current can thereby be interrupted as slowly or as quickly, up to a certain point, as is desired. G is a revolving wheel in connexion with a rheostat in its interior. This consists of ten sections, numbered respectively; and each of these, by throwing in a unit of resistance, in consequence diminishes the strength of the current, and *vice versa*. This rheostat does not profess to be an exact or measurable amount of resistance, but is simply a means of gradually increasing or diminishing the strength of the current for practical purposes. It has been so arranged that its power is convenient for clinical use. For example, when the instrument is attached to the full power of a forty-cell Leclanché battery, and the entire resistance is introduced into the circuit, a minimum amount of sensation is perceptible to the skin. As each division of the wheel is turned a tenth of the whole resistance is taken from the circuit, and consequently the current increases in strength, till when it reaches the last section, where there is no resistance, the full power of the forty cells is obtained. More correctly estimated by a galvanometer, the properties of this rheostat may be thus stated: Supposing the current from the forty cells passing through the human body to indicate 12 m.v., one unit of resistance of the rheostat introduced into the circuit reduces the reading to 11 m.v., and so on, till when the whole resistance is included 2 m.v. is the result.

This electrode therefore contains in itself all the essential elements for medical electrical appliances, and more especially for the purposes of electro-diagnosis. It may be attached to either the faradaic or galvanic currents. When in the hand of the observer, all the accessories can be put in action by the movement of one finger, thus greatly facilitating the delicate manipulations of the investigator, and obviating the necessity

of dividing his attention and altering his position, as he is compelled to do when working with an element-board. Finally, with this instrument, which can be carried in the pocket, the physician, provided he obtains a sufficiently powerful current, is independent of the imperfect construction of most of the apparatus now supplied to the profession, as all the necessary accessories he requires are contained in his electrode. The instrument has been manufactured by Mr. Hawksley, Oxford-street.—*Lancet*, June 24, 1882, p. 1027.

DISEASES OF THE ORGANS OF CIRCULATION:

18.—ON THE MURMURS OF DEBILITY IN THE PULMONARY AND TRICUSPID AREAS.

By WILLIAM RUSSELL, M.B., Honorary Physician to the Carlisle Dispensary.

Of the various theories advanced in explanation of the systolic murmur frequently present in the pulmonary area as a concomitant of debility, none has, perhaps, aroused more interest than the application by Dr. G. W. Balfour, of Edinburgh, to the solution of the difficulty, of Naunyn's theory that in organic mitral incompetence the systolic murmur heard in this region is a mitral regurgitant one, carried by the regurgitant stream into the dilated appendix of the left auricle, and audible here from the proximity of the appendix to the thoracic wall. In support of this view, it is maintained that the murmur attains its maximum intensity some distance to the left of the sternal edge, and that this point coincides with the position of the appendix; and, further, that the dilatation is occasionally, if not frequently, evidenced by an auricular pulse.

This murmur, sometimes alone, but frequently associated with a systolic bruit in other cardiac areas, is heard in a large proportion of all cases of debility, whether due to chlorosis, to the various fevers, or to parturition. It will not be seriously denied here that in these affections there is relative insufficiency of the mitral valve, the result of a debilitated and relaxed condition of the cardiac muscle, including the muscoli papillares. This insufficiency, however, is not always evidenced by a bruit at the apex, the point at which mitral bruits are ordinarily audible; but regurgitation is assumed from the accentuation of the pulmonary second sound, and from the presence of a systolic murmur in the pulmonary area. So far the facts may be accepted as indisputable, and the inference of mitral regurgitation granted, I think, without hesitation; but, with the utmost respect for the opinions of the distinguished advocates of the auricular theory, I venture to question the expla-

nation offered by them as to the place of production of the murmur.

It is necessary to the acceptance of the auricular theory that the murmur in question be present in organic incompetence of the mitral valve, whether associated with stenosis or not. Rosenstein, Guttman, and Balfour hold that it is present in such conditions. Rosenstein confines the murmur to the second space; while Balfour speaks of the "auricular area" as "above the fourth rib, to the left of the sternum," and ascribes the pulsation in this region, both in mitral regurgitation and mitral stenosis, to the auricle. The centre of interest in investigating this subject lies in the appendix of the auricle; for the idea of the murmur being conveyed direct from the body of the auricle, notwithstanding its depth in the chest, and that the pulmonary artery interposes between it and the parietes, is not likely to be received with credence. In the first place, there are, I believe, anatomical and other considerations which weigh against the appendix of the auricle being the site of the pulsation and murmur in question. The origin or root of the appendix is overlapped in part by the pulmonary artery, so to reach the parietes the appendix has to traverse a course equal to the diameter of that vessel. Any increase in the diameter of the artery, from increase of its contents, will thus place the appendix deeper in the chest; and the distance it has to travel towards its assumed destination is further increased by dilatation of the auricle carrying its root upwards. During dilatation of the appendix its movement is mainly a downward one, following the base of the ventricle as it contracts during systole. Doubtless there must also be, as Sibson points out, a certain amount of forward movement, but this can only be inconsiderable; and when Rosenstein speaks of the left auricular appendix lying on the anterior wall of the pulmonary ostium, he surely wanders, for the moment at least, into the realms of fancy. It is further recognised that, in debility, owing to dilatation of the right ventricle, the left is displaced outwards and backwards; or a change occurs which may be regarded as a rotary movement of the heart round its longitudinal axis; and this must be conceded as having a displacing effect on the auricle analogous to what it has on the ventricle of the same side. While holding that the normal position of the appendix is considerably distant from the thoracic wall, I deduce from the reasons stated above that the distance is increased in conditions of debility. That being the case, pathological anatomy has yet to show us to what extent the appendix shares, even in cases of organic disease, in the dilatation of its companion auricle, and in which of its diameters the dilatation occurs. My own observations lead me to believe that when it is enlarged

the enlargement is more transversely than longitudinally, and I have never seen it so enlarged as to warrant the belief that it is the cause of the extensive pulsation claimed for it by Dr. Balfour in the second and third spaces. In this connexion I may remind you that it is a frequently noted fact in mitral stenosis, where the conditions are peculiarly adapted to produce dilatation, not only that no such effect is necessarily obtained, but, in addition, that the appendix is frequently the seat of a thrombosis filling its cavity, showing conclusively that its physical conditions are such as allow its contained blood to form what can be little else than a sluggish eddy. And I venture to ask if it be not a pure assumption that, under such circumstances, and considering that the appendix only forms a side-chamber to the auricle, sound should be so readily and so invariably propagated into it as is assumed.

I shall now state what I believe to be the sequence of cardiac phenomena in cases of debility, and what I venture to suggest as their explanation.

The first indication given of valvular failure at the left *ostium venosum* is accentuation of the pulmonary second sound; this accentuation increases, and is soon preceded by a systolic murmur in the second left space. The murmur, while distinctly blowing in character, contains, at the same time, a rougher or harsher element, and is frequently not the purely soft, blowing sound heard at the apex in occasional cases. A further peculiarity of the murmur is, that during inspiration it gradually disappears—first losing its harsher element, then, towards the completion of inspiration, wholly vanishing. This is one stage, and no further change may occur save towards recovery. If recovery should not begin here, the murmur increases in intensity, and a systolic bruit, varying considerably in tone in different cases, appears in the third and fourth left spaces, between the costal cartilages, and simultaneously with this, a marked undulation, or even regurgitation, in the veins of the neck. Should the constitutional condition continue or become aggravated, pulsation becomes very marked, if it be not already so, in the second, third, and fourth spaces, the pulsation extending further out the lower the interspace, but not reaching the nipple line unless the apex pulsation be present, when the two coalesce. This is an outline picture of what occurs, and it can sometimes be followed step by step in such a gradually debilitating affection as hæmaturia following slight attacks of scarlet fever, and some of the more prominent stages of which were well shown in the following case:—

Case 1.—A lad, aged 17, who died of hemorrhagic purpura. There was pulsation in the second, third, and fourth interspaces. Over the side of pulsation in the fourth space the first sound

was metallic, with a slight impurity; at the apex the first sound was faint and impure, the impurity being heard towards the axilla. There was a well-marked systolic bruit in the second left space, lost half an inch from the sternum, not audible on the adjoining part of the sternum or in the third space, and only heard during expiration, completely disappearing with full inspiration. The pulmonary second sound was much accentuated; the veins in the neck were not distended. These notes were taken on the 7th or 8th of the month of admission. On the 12th, when the patient had become decidedly worse, there was no bruit or impurity audible over the apex or towards the axilla. There was a systolic bruit in the second, third and fourth interspaces, which was markedly loudest in the second space, where it was rasping in character. The jugulars were prominently pulsating. Notwithstanding the utmost pressure, we were forbidden to make a post-mortem examination of the case.

I shall hereafter refer to the murmur in the second space as pulmonary, and in the third and fourth spaces as tricuspid.

In some cases, I believe, both bruits appear almost simultaneously. In chlorosis one or both may be present, according to the stage at which the case comes under observation, and according to the state of cardiac debility. If the two murmurs be contemporaneously present the tricuspid may be the louder, and in some interesting observations on this point made by Dr. Money on parturient women, and communicated to the Royal Medical and Chirurgical Society, he found that out of 42 cases with murmur over the right heart 36 were loudest in the tricuspid area, this area being considered the fourth left space a little to the left of the sternum. In the more fully developed stages the murmur in the second space does not wholly disappear with forced inspiration; but this, in cases of extreme debility, may either be due to diminution in the muscular power necessary to the act, or be accepted as evidence that the murmur has no longer its seat in the pulmonary artery.

The following case, of which I have not preserved as extensive clinical notes as of Case 1, proves, I think, positively that neither the auricle nor its appendix was the seat of the murmur and pulsation in the second left space, and this under conditions which must be acknowledged as typical:—

Case 2.—A man, aged 30, who was the victim of pernicious anæmia. The apex of the heart beat in the fifth interspace, half an inch outside the nipple line. Over the apex there was a faint, blowing murmur, the intensity of which increased towards the sternum, and attained its maximum in the second and third spaces, half an inch from the sternal edge, and here the murmur was grating, although not loudly so, in character;

the murmur faded during deep inspiration. In the second space dulness extended outwards over an inch. I am indebted to the courtesy of Dr. Mortimer, the present house physician to the Wolverhampton Hospital, for a copy of the post-mortem notes recorded by me in the Hospital register with reference to this case. The origin of the pulmonary artery was under the second rib. In the second left space the right ventricle extended for fully two inches to the left of the sternal edge. The left auricular appendix was not visible, and was found to lie deeply, the heart having to be turned upwards to bring it into view. There was a "milk-spot" on the right ventricle opposite the third rib and fourth space.

Case 3.—A boy, aged 7 years and 9 months, who died of purpura hemorrhagica. While this case does not afford the same positive evidence as the preceding, it is yet of sufficient interest to be recorded here. On admission the pulmonary second sound was accentuated, but there was no bruit audible over the cardiac region. Ten days after admission, when the patient had become much worse, there was a systolic murmur in the second, third, and fourth left spaces, loudest in the second, about half an inch from the edge of the sternum; while over the sternum adjoining the fourth space it was somewhat coarsely rubbing in character. At the autopsy it was found that the origin of the pulmonary artery was under the second rib, while the adjoining part of the right ventricle extended slightly outwards in the second space. The appendix of the auricle was not unduly prominent and did not appear enlarged.

The murmur in the second left space is, I believe, produced in the pulmonary artery, save in the more advanced cases to which I shall refer hereafter. Its mode of production may be explained by a consideration of the relative tensions in the artery and in the left auricle, and in their anatomical relations to each other. Owing to the tension in the pulmonary vessels, the fulness of the auricle must at all times be increased; in fact, the blood coming from the lungs pours into it as rapidly as it empties itself into the ventricle, the result being that its cavity, although enlarged by sharing in the debilitating influences in existence, is already full before the ventricular systole not only prevents further relief to the tension in the pulmonary circuit, but throws back upon it (the auricle) the blood embraced by the segments of the mitral valve as they swing to close the auriculo-ventricular orifice, as well as the column of regurgitant blood from the ventricle. During the filling of the auricle it, according to Sibson, enlarges upwards, forwards, and downwards. The pulmonary artery, subjected to the same tension as the system of which it forms part, has its diameter

enlarged, and approaches the chest wall anteriorly and the auricle posteriorly. Now, what I assume to be the result in these circumstances is, that the dilated auricle presses upon the posterior aspect of the pulmonary artery, producing thereby a relative constriction of its lumen sufficient to create the fluid veins necessary for the production of a murmur. The anatomical relations of the parts warrant this explanation; and, if my view of what takes place be correct, it will not be doubted that it is sufficient to cause the murmur. According to this theory the distended auricle aids in pushing the pulmonary artery towards the chest wall; and in the degree to which this is done may, I think, be found the explanation both of the amount of pulsation produced by the artery in the interspace, and of the variety in tone assumed by the murmur, from the loud rasping (Quincke's explanation of which is accepted by Balfour) to the slight forms where it is a mere scratching. The harsh element in the murmur is attributed by Sibson and others to the seat of the murmur being superficial. It may, however, be accounted for in two other ways, namely, that it is a rubbing sound caused by the impingement during systole against the parietes of the point of junction of the artery and conus arteriosus; or that it is the result of the obstructive origin of the murmur, coupled with the condition of the blood. The former explanation is, I think, the more satisfactory, and is strengthened by the fact that the tricuspid murmur frequently presents the same peculiarity. While in the more aggravated cases, occasionally seen, the harshness of the murmur can be accounted for by an increase in the degree of constriction, from a greater dilatation of the auricle more markedly interfering with the lumen of the artery. And this would also explain the stenotic character at times displayed by the murmur.

The clinical evidence adducible in support of the explanation I offer, both of the mode of production of the murmur and likewise of its tone, is that during inspiration the rubbing element in the murmur is the first to disappear, while with deep inspiration the murmur, save in the more aggravated cases, vanishes altogether. The murmur is frequently so loud that the interposition of a more or less thin edge of inflated lung would not so completely obstruct its conduction as must be assumed it does if the auricular theory be accepted; whereas, with the explanation I suggest, its disappearance is accounted for by the elevation of the thorax during inspiration giving the resilient artery more room, whereby it is enabled to free itself from the pressure of the auricle behind it, and thus to regain its legitimate lumen.

I shall now briefly consider the murmur in the third and fourth spaces. The pulsation in these two spaces is over the

part of the right ventricle, which on dilatation is the first to manifest its dilatation by pulsation. In addition I have frequently observed the murmur in the spaces mentioned develop after the pulmonary one had been some time in existence, and concomitantly with the appearance of undulation or pulsation in the jugulars and a lessening of intensity in the pulmonary second sound. I therefore see no reason why it should not be accepted as a tricuspid regurgitant one. The only other feasible explanation is, that it is the pulmonary murmur conducted downwards; but the evidence against that is, that on the appearance of the tricuspid murmur the pulmonary one frequently lessens in intensity, the intensity being necessarily affected by the diminished force with which the blood is propelled into the vessel. And I have already referred to recent observations showing that the tricuspid murmur is the louder in the great majority of cases of a certain class.

While I thus believe the murmur in the second left space to be produced, in the earlier stages of debility, in the pulmonary artery, and that in the third and fourth spaces to have its origin at the tricuspid orifice, Case 2 showed that the murmur in the second space was heard, not in the pulmonary artery, but over the upper part of the conus arteriosus, and that therefore the murmur in this space is, in cases of great dilatation, really the tricuspid one, heard here in addition to the third and fourth spaces. That the pulsation in the second space, in cases of organic mitral disease, is due to the dilated right ventricle, I have frequently satisfied myself by post-mortem examination.

In aggravated cases of debility, and in cases with organic disease of the mitral orifice leading to dilatation of the right ventricle, it will, I think, be found that the pulmonary artery is relieved from the pressure to which it would otherwise be subjected, and which might seriously interfere with the passage of the blood to the lungs, by what is practically a rotatory movement of the heart to the left, whereby the left auricle is placed deeper in the chest and to the right of its normal position, while the origin of the pulmonary artery is carried upwards and to the left. By this movement the artery obtains a less rigid barrier along its anterior aspect, and secures an unobstructed course by being removed from the line of direct pressure between the auricle and the thoracic wall.

The foregoing may be briefly summarized as follows:—*Firstly*, Case 2 proves that the pulsation and bruit in the second left space, and that in a case of debility, was not due to the left auricle or its appendix; that, on the contrary, the pulsation was due to the conus arteriosus, and the bruit presumably tricuspid in origin. This is the usual condition in advanced debility and in organic disease of the mitral orifice. *Secondly*,

That in less advanced cases the murmur is produced in the pulmonary artery by the pressure of a distended auricle. *Thirdly*, That the murmur in the third and fourth spaces, and not infrequently in the second, is a tricuspid regurgitant one. *Fourthly*, As the cardiac changes progress the pulmonary bruit disappears, owing to the altered relations between the various parts of the heart and the thoracic wall, and has its place occupied by the tricuspid bruit.—*Edinburgh Medical Journal*, August, 1886, p. 130.

19.—ON ANÆMIA AND ITS TREATMENT.

By ALEXANDER DUANE, M.D.

The *treatment* of anæmia is to a great extent causal. The errors of diet, digestion, and assimilation once remedied, or the waste of nutrition arrested, the blood soon returns to the normal state. Of more immediate application are drugs which aim to increase directly the solid constituents of the blood. First among these is iron. The rationale of the action of this agent is by no means certain. While by many it is claimed to be a real corpuscular food, supplying to the blood cells the one essential material in which they were deficient, it is considered by others to owe its restorative powers to its effect as a stomachic tonic. Opinion is also divided as to the amount required to produce a beneficial effect, some recommending a high dose and using the more powerful preparations, others contending that a few grains a day of the milder preparations are fully as useful and much less irritating. In many cases of gastric disease iron causes harm by the disturbance of digestion which it occasions, and it has accordingly been proposed to administer it hypodermically. But this inconvenience can in general be avoided by the careful use of the milder preparations. Manganese is often associated with the iron, with the idea of increasing the efficiency of that agent. It is said to be itself contained in the corpuscles to a slight degree. However this may be, it seems to add little to the effect of the iron, and is by some accounted injurious in its action. Arsenic is often serviceable, and seems to act by improving nutrition. The same is true of cod-liver oil, which has been shown by Elbridge and Cutler to have a marked effect in increasing the number of red corpuscles. The use of tonics and the enforcement of exercise, bathing, and good hygiene tend in the same direction. The management of the diet is, of course, of the greatest importance in a disease which has its basis in disordered nutrition.

Toxic Anæmia.—Under this head are grouped a number of conditions in which the blood cells are destroyed by the influ-

ence of some agent which affects them while they are still circulating in the vessels.

Hæmatogenous jaundice has been defined to be a morbid state resulting from the development in the blood of a pigment resembling the coloring matter of the bile. This pigment, like all others in the body, is supposed to be derived from the solution of a number of the erythrocytes and the metamorphosis of their hæmoglobin. It may be caused by the entrance into the blood of any of the corpuscle-dissolving substances, such as water, ether, chloroform, the biliary salts, arseniuretted hydrogen, phosphorus, and the poison of serpents; also by the presence in the blood of septic material, as in some cases of pyæmia, puerperal fever, and pneumonia.

Paroxysmal hæmoglobinuria is an affection characterised by recurrent paroxysms, during which the urine becomes charged with free hæmoglobin. In nearly every case it seems to be excited by exposure to cold, although any agent which will produce hæmatogenous jaundice may also cause hæmoglobinuria (arseniuretted hydrogen, pyrogallic acid).

Traumatic Anæmia.—This is a term applied to an impoverishment of the blood caused by hæmorrhage. The latter may owe its origin to the exaggeration of a physiological process, as in menorrhagia, to accidents connected with pregnancy and the puerperal state, as in abortion, placenta prævia, and post-partum hæmorrhage, to traumatism, to ulceration upon a surface and excavation within an organ, to the development of certain new growths, such as aneurisms, fibroids, and cancer, and to the existence of a hæmorrhagic diathesis.

Pernicious Anæmia.—This is a disease which is essentially characterised by a rapid and progressive diminution in the number of corpuscles, with the production of symptoms of the most profound anæmia, which continually increases in severity and finally causes death. It has been known under a variety of names for a number of years. Thus, as Runeberg points out, it was described in the latter part of the last century by Good under the title of “marasmus an hæmia.” The English physicians first brought the disease into general notice, Addison and Barclay describing cases between 1843 and 1855. Lebert in 1853 gave the history of a case under the designation of “puerperal chlorosis,” and Wilks in 1857 sketched the disease as an “idiopathic fatty degeneration.” Others have called it “essential anæmia, the “extreme anæmia of pregnancy” (Gusserow, 1871), “idiopathic anæmia” (Habershon, 1863), “fatal anæmia” (King, 1871), and the “anæmic form of fatty heart” (Ponfick). Biermer, who had observed one case in 1868, gave in 1871 the first detailed description of the disease, basing his account upon the history of fifteen cases. Lately

Lépine has given a summary of the scattered observations up to the date at which he wrote, and Coupland has given a very complete description of the disease, founded on the statistics of 110 cases.

Although so much study has been expended on the disease, considerable doubt yet remains as to its *nature*. By some it is regarded as merely an aggravated form of simple anæmia, being induced by any very severe or constant drain upon the system, and Scheperln points out the pathological as well as the etiological identity existing between some forms of traumatic and pernicious anæmia. Indeed, the preponderance of evidence seems to be in favour of considering it as rather a symptomatic than an essential disease. Nevertheless, the exciting causes are generally such as would ordinarily produce only a moderate degree of anæmia, and we must therefore agree with Runeberg that an individual predisposition is necessary in order to give rise to the pernicious variety. Of those who hold to the distinctive character of the disease, some assign a nervous, others a myelogenous, origin. Thus, King, in the case which he observed, regarded the affection as dependent upon a lesion which he discovered in the sympathetic, and Little suggests that a morbid change in the vaso-motor region of the sympathetic may be the primary cause, the changes in the blood being secondary. Brigidi, it may be noted, found in one case a lesion of the coeliac plexus. On the other hand, the nearly constant presence of changes in the bone-marrow has led observers to consider pernicious anæmia as due to a disturbance of the blood-forming organs, and Pepper regards it as a myelogenous pseudo-leucæmia. But the fact that these medullary lesions occur in the most diverse forms of disease, some of which are evidently not due to their agency, would show that they are the result rather than the cause of the blood changes.

Again, observers are in dispute as to whether the anæmia depends upon an excessive destruction or a deficient formation of red cells. Scheperln argues for the latter view, since the diminution in area which exists indicates a depression in the activity of tissue-metamorphosis. With him agree Hansen and Lodi. Yet there seem to be cases in which excessive destruction of the corpuscles forms the basis of the blood impoverishment.

The *etiology* of the affection is somewhat unsettled. In many cases no satisfactory exciting cause could be detected. The list given by Eichhorst probably covers most of the causal factors, and includes pregnancy and parturition, especially if oft-repeated, lactation, successive hemorrhages, and diarrhoea. The first-mentioned cause appears to be the most important, 20 out of the 110 cases collected by Coupland being ascribed to its

influence, while 11 were brought on by bad food and defective hygiene. Other cases were induced by nervous care and worry. Malaria, yellow fever, and typhoid fever seem to have acted as predisposing causes in a few instances. Occupation seems to exert an influence, as Ruhle mentions a form observed in brick-makers, while another variety is described as prevalent among mountain-climbers. Finally, a form was developed among the labourers in the St. Gothard Tunnel, where the disease was found to depend upon the presence of an intestinal parasite.

As to the influence of age, it is found that, while in men most cases occur after forty, in women the reverse holds good. The connection of the disease with pregnancy and lactation explains why with women it should be most prevalent before the child-bearing age has passed. It is present about equally in both sexes.

The *pathology* of progressive pernicious anæmia includes in general the same changes in the blood which are met with in simple anæmia, as well as changes in the bone-marrow and in the various organs of the body. The most marked feature among the blood lesions is the great diminution in the number of erythrocytes and in the quantity of hæmoglobin. Both these constituents may fall to one half, one third, or even one sixth of the normal. Even this limit is exceeded, and a reduction to one tenth is now and then observed. Quinke in one case found the number of corpuscles diminished to one thirty-fifth of the normal (143,000 in a cu. mm.), and Fenoglio reports one instance in which the blood corpuscles had fallen to one thirty-eighth of the usual amount. These represent probably the most extreme degree of cell poverty compatible with life. Besides the diminution in number, the erythrocytes frequently display anomalies in size, shape, and physical characteristics. The occurrence of both abnormally large corpuscles and of microcytes has been often remarked (Eichhorst, Quinke, Bell and Osler, Noder, Bischoff, Mackenzie, and Litten). Indeed, Eichhorst regarded the presence of microcytes as pathognomonic of the disease; but this is certainly not the case, as these small cells have been observed under other pathological conditions. Moreover, they are not of constant occurrence in this condition, having been absent in two cases observed by Leichtenstern. Hayem finds an unusually large number of hæmatoblasts, which, allowing his explanation of blood-formation to be correct, would be corroborative of the theory that the disease is due to an arrested development of the red corpuscles. If, however, his hæmatoblasts are regarded as identical with the microcytes of other observers, and so represent the disintegrated fragments of the blood cells, their presence forms an

argument for the hypothesis that the disease consists in an increased destruction of the erythrocytes. Perhaps an additional argument for this latter view is found in the statement of Hayem that the white corpuscles are more or less tinged with hæmoglobin, which they have presumably derived from the breaking up of the red cells. A more direct evidence of the fragility of the erythrocytes is seen in the anomalies of form which they present. This occurrence of poikilocytosis has been remarked by several observers (Scheperln, Noder, Bell and Osler, Bernheim, Ruhle, Kant, and others), and has been made the subject of special study by Quincke. The latter describes the following variations: Grouping into irregular masses instead of forming the usual coin-like piles; rapid appearance of crenation; assumption of a pyriform, globular, or biscuit shape; eccentric disposition of the central depression; accumulation of the colouring matter in one portion only of the cell. In two cases mentioned by Litten the central depression was so deeply excavated as to appear punched out, and the corpuscles looked like rings. In one case Scheperln observed amœboid movements in the irregularly-shaped cells, furnishing an additional proof of the corpuscular instability.

On the other hand, the presence of nucleated red corpuscles in the blood is to be regarded as an evidence of arrested development, and so is corroborative of the theory which bases the disease upon a diminished formation of the erythrocytes. According to Ehrlich, it is the large nucleated cells (megalo-blasts) which preponderate in pernicious anæmia. These megaloblasts do not throw off their nuclei entire, as do the small nucleated cells found in ordinary anæmia, but lose them by a process of intra-cellular degeneration. Nucleated cells, however, are by no means of constant occurrence in pernicious anæmia, and, according to some authors, they are never present at all, those who assert the contrary being the victims of some optical illusion. Hayem, for instance, believes that those who think they are witnessing a nucleated red corpuscle have under view an ordinary white corpuscle rather deeply stained with hæmoglobin.

The white corpuscles may or may not be increased in number. Other alterations in the blood are rare. Masses of granules are sometimes seen, and bacteria have been noticed. But as the latter were seen in the blood after death, when bacteria are liable to occur under any circumstances, the observation loses any significance which may have been attached to it. The total amount of blood is diminished, as was shown in two cases which Quincke tested by the method already given of counting the corpuscles before and after transfusion.

The changes occurring in the bone-marrow, and described by Cohnheim, have been regarded by some as pathognomonic. They consist chiefly in a replacement of the fatty matter by the red or lymphoid variety, in the development of numerous transition forms between the embryonic and the fully-grown erythrocytes, and in the occurrence of degeneration forms of the latter. For reasons already given, these changes are regarded as rather the result than the cause of the blood lesion, and in any case are not distinctive of the disease. They probably represent an attempt at reparation of the loss of material from the blood, since they may frequently be observed after a severe hemorrhage.

The other lesions belonging to the disease consist chiefly in a fatty degeneration, which may affect the liver, kidneys, and alimentary canal, and which is nearly constantly present in the heart (Coupland). The latter organ is often in a state of dilatation. The aorta is found to be contracted in some cases. Pigmentation of the liver and hepatic capillaries (siderosis) was found by Quincke, and was ascribed by him either to increased destruction of the old red corpuscles or to diminished appropriation of their hæmoglobin for the formation of new cells. Finally, among the pathological changes arising from the disease are to be included the appearance of pallor and emaciation due to the general failure of nutrition, as well as the lesions of the complications, such as œdema, dropsy, and hemorrhage into various parts of the body.

The *symptoms* are in general those of a simple anæmia carried to an excessive degree of severity. The invasion may be gradual or sudden. The initial symptoms are pallor, muscular debility, digestive troubles associated often with excessive thirst, cardiac palpitation with a tendency to syncope, dyspnœa on exertion, headache, vertigo, ringing in the ears, and multiform nervous disturbances. All these troubles are usually progressive; the cardiac symptoms become more marked, the dyspnœa constant, the nervous disorders more harassing. The sleep is frequently disturbed, and delirium may occur, which toward the end may be succeeded by convulsions. Further, a severe and obstinate diarrhœa is the frequent accompaniment of many cases. As the disease goes on, a tendency to the formation of a hemorrhagic diathesis is developed, which makes itself apparent most often in the form of retinal hemorrhages. So frequently does this latter symptom occur that it has been considered to be characteristic of the disease. The effusion of blood is regarded by some as due to the rupture of the retinal vessels, but Schepers found in only one case any alteration of the vascular walls, and therefore ascribes the hemorrhage to a simple diapedesis. A form of inflammation (retinitis

anæmica) appears to be excited by this extravasation. Less frequently hemorrhages occur in other parts of the body, as epistaxis, menorrhagia, intracerebral and sub-dural extravasation, petechiæ, and sub-peritoneal effusions. Œdema and dropsy also appear late in the disease, partly as a result of deficient heart power, partly on account of the facility offered to transudations by the nutritive alterations taking place in the walls of the vessels.

A sign upon which some stress has been laid on account of its supposed diagnostic importance is a tenderness excited by pressure over the sternum and other bones. It is not, however, of constant or even of very frequent occurrence.

Fever is generally, though not invariably, present. Like anæmic fever from other causes, it is very irregular in course and subject to sudden exacerbations. Yet, in spite of the increased temperature, there is diminution of tissue-metamorphosis, as shown by the decrease in the amount of urea excreted. It is a remarkable fact that, while in other respects the patient may present all the signs of anæmia and debility, his external appearance is that of one who is fairly nourished and who possesses a good amount of fat.

The chief objective signs, besides the general aspect of the patient and the evidence furnished by an examination of the blood, are the cardiac and venous murmurs, which are similar in origin and character to those found in ordinary anæmia. Examination of the urine shows a diminution in the urea and uric acid, but generally no other abnormalities, except sometimes the presence of albumen. The presence of iron has also been noticed in one instance.

The *course* of the disease is usually unremitting. The gastric, cardiac, respiratory, and cerebral troubles steadily increase until the patient is brought into a very pitiable condition, in which he suffers from continual dyspnoea and palpitation, from distressing vertigo and headache, and from complete muscular prostration. Nevertheless, this is not the invariable rule. In nine cases observed by Runeberg, the course was discontinuous and marked by periods of spontaneous improvement. The duration varies; in some being only a few months (34 per cent.), in others (26 per cent.) from six months to a year, in others, again (27 per cent.), from one to two years, and in the remainder two years and more (Coupland).

The *prognosis* is bad, though not absolutely so. Indeed, out of 110 cases, Coupland records 20 that ended in recovery. But many of these so-called recoveries were probably mere delusive intermissions in the disease, the cases not having been under observation long enough to justify the formation of a positive opinion. Different symptoms to which a prognostic value has

been assigned seem not to bear such an interpretation. Thus, it was thought that when the hæmoglobin was reduced below one-fifth of the normal a fatal termination was inevitable; but in several cases a much lower limit was reached, and yet a cure was effected. Again, the retinal hemorrhages which were considered to be a sign of fatal import are not invariably so.

The *diagnosis* of the disease is often difficult. Scheperlin thinks that he has discovered transition forms between pernicious anæmia and both leucæmia and pseudo-leucæmia which render it especially hard to distinguish between these three affections. Moreover, it is quite impossible to diagnosticate some cases of cancer of the stomach and intestinal ulcer from pernicious anæmia.

The *treatment* is mostly without result. The drugs which have met with the greatest success are arsenic and iron, aided (in a case of Lachmann's) by large doses of quinine. Dietetic and supporting measures are also of service. Transfusion of blood has been resorted to, for the most part with but little success. In the hands of Quincke, however, it is said to have been efficient in the cure of five cases.—*New York Medical Journal*, Dec. 1881, p. 576.

DISEASES OF THE ORGANS OF RESPIRATION.

20.—ON ANTISEPTIC INCISION AND DRAINAGE IN EMPYEMA.

By F. RICHARDSON CROSS, M.B., F.R.C.S., Surgeon to the Bristol Royal Infirmary.

An empyema may be localised or even sacculated. Such cases usually result from caries of a rib or ulceration of the thoracic wall, or from a similar morbid process in the remains of a pleuropneumonia. Dr. Wilks has said, "If, under any circumstances whatever of an inflammatory attack in the chest, under whatever name that attack may be called, there result localised dulness with absence of breath-sounds, and perhaps distant tubular breathing, an empyema may be safely suspected." He has seen five cases of such localised empyema in one year fatal by bursting into the lung, and recommends that, if a single tapping do not cure them, they should be treated by free incision.

In all cases of local or general empyema, free incision, without any special precautions, should give better results than those left to natural processes, because the cases are earlier relieved, and the opening is made convenient for effective drainage. Dr. Fuller, in 1872, had seen no fatal cases treated under

him by this method since he had been connected with St. George's Hospital. But a free incision soon heals, until it is merely a narrow sinus through the chest-wall, not large enough to allow free escape from the pleura. The pus collects, and, by reflex irritation of the pleura, is soon largely increased in amount. This tendency can be perfectly met by the use of Chassaignac's drainage-tube. No counter-opening is necessary, the original incision being always at the best available site for drainage. The end of the tube should reach any pocket of pus that may exist.

In cases of fistula remaining after escape of empyema, a properly arranged system of drainage through the fistula, or by a more advantageous counter-opening if necessary, will often effect its closure. Syringing is useful in these cases, not by rendering the sinus antiseptic, but by helping to dislodge the offending matters which escape, whilst the comparatively innocuous injection dilutes or replaces them in the pleura. In recent acute cases, syringing does harm; it irritates the pleura, causes increased continuance of the effusion, and may even produce a fatal result from shock. One of my cases, treated by good drainage under Listerian precautions, and which was perfectly cured, after the removal of the drainage-tube on the fifteenth day, had to be re-dressed each day for the first nine, as I now think by reason of the syringing that I (officiously) used causing excessive secretion. With properly arranged drainage, syringing should not be necessary; but if the discharge should continue for a long time purulent, and bagging be suspected, it should, I think, be carefully used to flush out the pleura, and the necessity or otherwise of its further employment will be indicated by the character of the fluid that escapes after its injection.

Some cases of old-standing fistula may be prevented from filling up by rigidity of the thorax, or fixation of the viscera, preventing apposition of the pleural surfaces. I believe that, with proper drainage, assisted, if necessary, by syringing, this will rarely occur; but if it do, resection of a piece of one or more ribs will permit falling in of the chest-wall, and tend to closure of the sinus. Such a proceeding is quite uncalled-for at an early period.

Good drainage is the essential consideration in the treatment of empyema, but there is another side to the question scarcely less important—the prevention of putrefaction or of foetid decomposition in the pleural contents. So long as pus is contained within its abscess-sac, it does not putrefy; but putrefaction is immediately brought about by contact of putrefactive agencies abundant in the outer world, or in the mucous tracts of the body immediately in communication with it. Pasteur's experiments

show that the putrefactive elements are not the gases of the atmosphere, but solid particles floating in it, as well as abundantly present on the surface of the planet. Air itself would harm the pleura by physical or chemical contact, but its exclusion is a matter of very small importance, provided the vital putrefactive agents in it be excluded.

I should prefer to treat an empyema by absolute exclusion of air, if this could be satisfactorily combined with continuous drainage; but I do not think it practicable; for the granulation-tissue which must develop around a tube passed through the intercostal tissues secretes pus, and thus provides a putrescible channel between the pleural contents and the atmosphere; and if ulceration occur instead of granulation, the tube-tract in the chest-wall is no longer even air-tight. The difficulties in the way of emptying the pleura without admitting anything to replace the discharging pus, and the doubtful usefulness of any form of traction to encourage the expansion of the lung, militate still further against prolonged aspiration or any form of continuous suction. On the other hand, atmospheric pressure in the pleura directly upon the lung does not seem to interfere with the ultimate expansion, and, provided the putrefactive agents be destroyed, the presence of air is scarcely prejudicial. I, therefore, submit that the most satisfactory way at present of treating empyema is by a free dependent opening into the pleura, with good drainage, under full Listerian precautions, which allows free and full escape of the pus, and admission into the pleura of an aseptic atmosphere until such time as the visceral and parietal pleuræ come into contact.

As to the site for drainage. the most dependent part of the pleura, when the body is supine, is the tenth rib at its angle. An incision made along its upper border, just outside the angle, is as low in the chest as it is usually safe to go. The lower intercostal spaces are widest, and posteriorly more so than at the axilla, admitting a full-sized drainage-tube. The lower angle of the scapula rests on the eighth rib, I should incise just outside the angle of the rib, never above the eighth space; and if the effusion be very large, should prefer the tenth.

The drainage-tube requires careful management. If it be left in too long, the sinus cannot close; and, even if the empyema be practically cured, the granulation tissue along the tube secretes a good deal of pus. On the other hand, it should not be withdrawn too soon. In one of my cases I thought it produced dyspnoea, and unwisely withdrew it the second day after the operation, but reintroduced it two days afterwards, with relief of a great deal of pus. On the seventh day after the operation, the empyema was replaced by a serous discharge,

and I again discontinued the drain; the wound did not heal until seven weeks after the operation. Had I drained for a fortnight, I believe it would then have been cured in a third of the time.—*British Medical Journal*, April 29, 1882, p. 611.

21.—TREATMENT OF STRICTURE OF THE ŒSOPHAGUS.

By KENDAL FRANKS, M.D.Dub., F.R.C.S., Surgeon to the Adelaide and to the Throat and Ear Hospitals, Dublin.

Strictures of the œsophagus are usually classed under four heads—congenital, spasmodic, organic, and malignant. I propose to confine myself to the third variety, firstly, because they are not of very common occurrence, and secondly, because their treatment is on the whole so unsatisfactory that any successful treatment which might tend to give us more hope in dealing with these cases deserves to be reported, and must be my excuse for treating of these strictures somewhat in detail.

Organic constriction of the œsophagus may be of two chief kinds, according to the nature of the constricting agent. A hypertrophic condition of the mucous and sub-mucous tissue, or of the muscular coat, may cause a narrowing of the tube; or a cicatricial contraction may be the immediate cause, resulting from a loss of substance which may have undergone more or less of the healing process. This, as in organic stricture of the urethra, may be associated with atrophy of the structures engaged, or the opposite condition sometimes holds good. The exciting cause in each case is different. In the hypertrophic form, whether of the mucous membrane alone, or of the mucous membrane and sub-mucous tissue, or of the muscular coat, there is always a previous history of a chronic œsophagitis. This inflammatory state may be brought about in many different ways, but when once well established and strengthened by repeated recurrences or relapses, the inevitable result is the increase of those elements which constitutes a thickening or hypertrophy of these tissues. Unless a retrogressive process takes place, and these elements are removed, one condition can alone result—a greater or less diminution of the original calibre of the gullet, so that on the one hand but little inconvenience may result, or on the other hand, a more or less complete obstruction may ensue.

The more common form of stricture of the œsophagus is that which is caused by cicatricial narrowing, the result of the healing of a loss of substance arising from any cause. When the œsophagus has been injured to such an extent as ultimately to give rise to cicatricial narrowing, there may be two stages of acute dysphagia. The first appears shortly after the injury, and is due to the amount of acute inflammation which follows

in the œsophagus, and which may be accompanied by acute gastritis or enteritis, this inflammation rendering the ingestion of either solids or fluids difficult. As the œsophagitis disappears and cicatrisation begins, these urgent symptoms subside, and for a time the patient has an interval, often of long duration, during which he may believe that he has completely recovered. But as the cicatrices contract, and deglutition again becomes impaired, he finds the symptoms returning, and ever with increasing severity, till dysphagia is complete, and if unrelieved he goes through all the horrors of slow death from starvation.

Many methods have been recommended for the treatment of stricture of the œsophagus. They may conveniently be grouped into four classes:—1. Dilatation; 2. Cauterisation; 3. Internal and External Œsophagotomy; 4. Gastrotomy.

Gradual Dilatation is the method most frequently employed. The object aimed at is to cause gradual absorption of the organised lymph, or when this is not possible, to retain or even to increase the opening through the constriction. Numerous instruments have been devised: carefully graduated gum-elastic bougies, whale-bone bougies with conically-shaped ivory bulbous ends, bougies with various sized sponges at the extremities, bougies daily smeared with a little fresh wax so as gradually to increase the size (recommended by Trousseau), and many others. Of all these instruments the best, and therefore the most frequently used, are the gum-elastic bougies. Great stress has been laid on the graduation of these by Bouchat, who has also laid down rules as to the best methods of employing them. The first of these is that the bougie should be left *in situ* for five or ten minutes, *if the patient can bear it*. The head should at the same time be advanced so as to allow the large quantities of saliva and mucus which are elicited by the catheterisation to flow away easily. Secondly, the size should not be increased till the former one has been used for three or four days. Thirdly, in children from two to fifteen years of age the canal should not be dilated more than from 15 to 19 millimetres, and in adults it should not exceed 2 centimetres (about 4-5ths of an inch). Some have suggested leaving in an instrument permanently. To do this the bougie is passed through the stricture in the ordinary way, and the proximal end is subsequently drawn up behind the palate, and out through the nostril by means of a Bellocq's sound. Switzer's method is based on the same principle. He employs short ivory tubes of various sizes; the largest that can be introduced is passed through the stricture by means of a whalebone rod and there left *en permanence*, the whalebone rod being withdrawn. In order to be able to remove it at pleasure, a strong silk thread is made fast to the ivory tube.

Rapid dilatation, or bursting the stricture, was first proposed by Fletcher, and since then several instruments have been devised, many of them based on similar instruments employed in stricture of the urethra. The results have been for the most part doubtful, though in the case I shall immediately relate it proved most successful. Of course, this rapid method should invariably be followed by patient and persistent use of catheterisation.

Cauterisation seems to have had its day. In spite of the eulogistic manner in which it has been spoken of by Sir Everard Home, Charles Bell, Darwin Andrew and others, it has now almost ceased to be recognised as a legitimate method of dealing with these strictures, though in some cases it seems to have undoubtedly been of use.

Internal œsophagotomy was employed for the first time in 1861 by Maisonneuve, and his example has been followed by Trélat and other French surgeons. The first employed an œsophagotome constructed on the same lines as his urethrotome. He divides the stricture from above downwards. Trélat used an instrument devised by himself, and with which he made three incisions through the substance of the stricture, cutting from below upwards. This method has been employed in eight cases, of which five recovered, one of the failures having died of a complication unconnected with the original disease, or the operation performed for its cure. No serious difficulties were experienced in any of the operations, but catheterism was required subsequently in all the cases. The operation is scientifically a sound one. The experiments of Reybard on the urethra of animals have shown that the longitudinal section of a canal is never followed by a stricture, but, on the contrary, that the cicatricial tissue which develops has always a tendency to become dilated.

I need not here enter into the details of *external œsophagotomy*. It has been practised in three situations—above the stricture, at the site of the stricture, and below it. The last has been most frequently employed, but it is only a palliative measure. The two former aim at being curative. The results arrived at have not been very encouraging, as of nine cases collected up to 1880 eight died within a year, Tarenget's case alone surviving sixteen months.

Nor are the statistics of *gastrotomy* better. Hitherto it has been had recourse to only in very extreme cases, mostly malignant, and at a time when patients were all but exhausted by prolonged suffering and starvation. Of twenty-two reported cases, only one by Verneuil proved a success. Some of the remainder survived a few months. These facts are not discouraging when we remember the urgency of the case, and

not only warrant the performance of the operation under similar circumstances, but warns us not to postpone it till the recuperative energy of the patient is at its lowest, for even should the operation be unsuccessful, at least the patient is saved from a painful and horrible death.

To review, then, these various operative procedures, and to determine their applicability in various cases, we must, in the first instance, determine whether the stricture is permeable or absolutely impermeable. In the former case the general consensus of opinion is in favour of the method by dilatation; and this should always be tried, provided that the stricture is not of an undilatable kind. But should the stricture be exceedingly hard, and catheterism be accompanied by violent pain, the use of the bougie becomes intolerable and useless, and our best chances of success lie in the method of internal œsophagotomy, which does not seem to be very difficult, and offers a prospect of a successful issue.

In dealing with any form of stricture of the œsophagus we need not be discouraged by failure. "The treatment of stricture of the œsophagus," writes Mr. Pollock, "is summed up in a very few words. . . . If permanent, from cicatrix or other disease, we can offer very little hope of benefit from treatment." Such is the deliberate opinion of an eminent authority. The result of treatment is doubtful, and the surgeon is bound to give his patient the benefit of the doubt, for without treatment the result is certain, and that certainty is starvation.

The following case, which came under my observation in October last, illustrates some of the points which I have alluded to in this paper:—

M. L., æt. 20, a domestic servant, was admitted to the Throat Hospital on October 27th, 1881, complaining of a difficulty of swallowing. She had always enjoyed good health, and had never suffered from any affliction of the throat until four and a-half years ago, when one morning at breakfast a piece of hard crust stuck in her throat. She could not get it down, and her fellow-servants slapped her on the back. Retching soon came on, and the crust was ejected. There was no subsequent hemorrhage. Afterwards she experienced pain and difficulty in swallowing, and every day this grew worse. Particles of food used often to stick in the throat, and she used to get them up again with her fingers. By degrees even fluids became difficult to swallow. There was no variability in the dysphagia, and she evinced no symptoms of a nervous habit. It made no difference in the degree of the dysphagia whether her attention was fixed on the act or not. She was in one of the Dublin hospitals for a short time, but

a bougie was never introduced. Iodine and blisters were at several periods applied to the throat, but they afforded no relief.

She was when admitted tolerably healthy-looking, though exsanguine and somewhat emaciated. She has lost a great deal of flesh. Before her throat became afflicted she was fat, and weighed between three and four stones more than she does at present. She refers the pain and obstruction to a point about three-quarters of an inch below the cricoid cartilage, where she says she feels as if something were sticking. A laryngoscopic examination shows that the larynx is quite healthy; it was abnormally pale. There was no displacement or swelling. I tried to pass an ordinary œsophageal bougie, but at the point indicated by herself it was obstructed, and no effort could get it past without undue force and laceration of the tube. She bore the attempt wonderfully well; she was very brave, and exhibited no signs of nervousness, and was only anxious that some operation might be done which would give her relief.

After the withdrawing of the bougie she was able, with great difficulty, however, to get down some beef-tea and milk. The next day I tried to get in a No. 8 (English gauge) catheter. Great difficulty was experienced, as the œsophagus seemed dilated above the stricture; and I had to probe about against the floor of this dilation with the olivary point of the catheter before I could find the opening. At last, and after many attempts, I succeeded in worming the catheter through, and I then left it *in situ*. It was retained for an hour, during which period the patient sat on a stool, leaning over a basin, while stringy mucus and saliva in great quantities poured from the mouth. After its withdrawal she experienced great relief, and shortly afterwards was able to swallow some beef-tea with more ease.

On the 20th, two days later, the same catheter was inserted, and retained for a few minutes. After its removal I was able to get in a No. 11, though with considerable difficulty. This was retained for two and a-half hours. She was able afterwards to get down some mashed potatoes.

On the 22nd the No. 11 was again introduced, and retained for three hours. On the following day she was able to get down a small portion of well-chewed meat, the first she had been able to swallow for four years.

On the 24th the No. 11 was retained for three and a-half hours. She complained still of the sticking pain in her throat, but otherwise was feeling better.

On the 26th the same catheter was retained for four hours.

On the 29th I introduced a catgut guide through the stricture, and over it passed in a No. 12.

On the 31st the No. 12 was retained for five hours.

On Nov. 2nd I introduced Otis' dilating urethrotome without the blade, and dilated the stricture to the full size of the open instrument. This caused a good deal of pain, and for some time afterwards the mucus discharged was tinged with blood. Immediately after its withdrawal I introduced an ordinary œsophageal bougie (about three-eighths of an inch in diameter). This was retained for several hours.

On the 3rd a conically-pointed rectal bougie (about half-an-inch in diameter) was passed with comparative ease, and kept in for six hours. This was passed every second day till the 9th, when I succeeded in introducing Mr. Tufnell's full-sized rectal bougie. The part which was held in the stricture was about five-sixths of an inch in diameter, and this was retained for one hour and a-half.

I need not detail the further treatment of the case more than to say that this large bougie was passed almost daily till the 22nd of December, and retained each time for periods varying from one and a-half to four and a-half hours. She was then discharged, and went to a situation in the country. I heard from her the other day, and she then stated that she was able to swallow all kinds of food without difficulty or pain. She expects soon to come to Dublin, when I hope to have an opportunity of again passing the bougie, and thus determining the amount, if any, of contraction.

I do not anticipate that the cure is complete, but I hope by the occasional introduction of bougies to retain the calibre of the œsophagus at its normal size. The case is, I think, interesting, as showing that satisfactory results may be looked for in cases of fibrous stricture of the œsophagus, and as affording us proof that the slower method of gradual dilatation may be successfully supplemented by the more rapid method of immediate dilation by rupture.—*Medical Press and Circular*, April 19, 1882, p. 332.

22.—USE OF ERGOT IN PERTUSSIS AND NASAL CATARRH.

By JOHN DEWAR, Esq., L.R.C.P., &c., London.

From its action on the circulation and the nervous system it is evident that ergot possesses a wide therapeutical range. In mentioning a few diseases in which I have found it useful I would place at the head of the list pertussis.

I am aware that in this disease a vast number of remedies are useful, but after a pretty extensive trial both in hospital and private practice I am inclined to regard ergot as the best and safest. Up to the time when I began to use ergot I regarded the combination of bromide of potassium and tincture

of belladonna, or sulphate of zinc and tincture of belladonna, as the best remedies with which I was acquainted, but that sometimes necessitated the belladonna being pushed to its physiological action before the disease would yield. That was sometimes not unattended with danger in young children unless they were carefully watched, which cannot be easily done in hospital or dispensary practice. Ergot seldom fails to cure whooping cough in from one to three weeks; the cases that are longer in getting better are those complicated with bronchitis, or with troublesome bronchial catarrh. I give from four to fifteen minims of the liquid extract every three or four hours to children of three months and upwards. The benefit of the *secale* is at once apparent, the fits of coughing occur less frequently, and are not so severe when they do occur. I usually give it alone with a little sugar, but in complicated cases it may be combined with other remedies, and especially with the compound syrup of the phosphates to complete the cure when there is debility.

What is the action of ergot in whooping cough? We must regard the spasmodic cough as due to reflex action, and that in its turn brought about by the peculiar condition of the blood irritating the peripheral ends of the sensory nerves. Ergot dulls or paralyses these nerve ends and so lessens and eventually prevents the spasms. The true pathology of whooping cough may yet be considered doubtful, but I regard it as a germ disease, as only on that ground can we explain its infectious nature. I do not here claim for ergot any *specific* power, but rather a physiological one. It *may* have a specific action, but of that there is as yet no proof. However, of its power to cut short the disease there can be no doubt, whatever be the theory of its action. This I have in scores of cases proved, nor is it necessary to give cases in detail, as all the cases would simply show a daily declension of the disease till, at the end of a fortnight or three weeks, the cough quite ceased. But in some cases the cough returns when the medicine is left off, so it may have to be continued for two or even three months, this, however, is the exception.

The power of ergot on whooping cough throws some light on its physiological action. Indeed clinical or therapeutical observation often aids physiological research, though without experimental (vivisectional) investigation the therapist would be in hopeless darkness. Its action in whooping cough appears to me to favour the theory that the sensory peripheral endings only are affected, as central anæmia of the cord from constricted vessels could scarcely account for the *speedy* anti-spasmodic action of the drug, though later on it may have something to do in bringing about a cure.

Ergot seems to be useful and deserving of further trial in *nasal catarrh*. This troublesome complaint, which has hitherto resisted all remedies, if taken in its early stage may be cut short by a full dose of ergot—repeated if necessary.—*Practitioner*, May, 1882, p. 356.

23.—ON THE CURABILITY OF ACUTE TUBERCULOSIS.

By OCTAVIUS STURGES, M.D., Physician to Westminster Hospital.

The case I propose bringing forward involves a curious problem of practical medicine in the nature of a dilemma. Acute tuberculosis is represented to us from the anatomical point of view as a disease which is uniformly fatal. At the bedside, however, we meet with examples, indistinguishable from acute tuberculosis, which nevertheless recover. Are we to say of these that our diagnosis has been in error, or that the statement of the uniform fatality of acute tuberculosis is not without exception? Is it more probable that the diagnosis is wrong or the treatment curative? If the diagnosis be in error, how may such errors be avoided in the future? If it be the treatment that makes all the difference, in what manner is such treatment to be employed, what is the evidence of its efficacy, and to what stage of the disease does it apply? I need not say that questions like these are of the highest practical interest. They are so from the pathological side, owing to the very intimate likeness between acute tuberculosis and enteric fever. They are so still more from the treatment side, owing to the assertions of some that the hypophosphites of lime and soda are directly curative of acute tuberculosis.

Now the case shortly summarised from the notes of Mr. Butler, clinical clerk, is as follows:—

George C—, aged sixteen, a well-nourished youth, but of tubercular aspect (his mother being consumptive, and two of his maternal aunts having died of acute phthisis), was admitted on May 31st. Just a month before, he had been standing at a pier-head when heated from fast running, and in that way, as he supposed, caught cold. Shivering came on the next day, and he kept his bed for a fortnight, being “very ill;” the chief symptoms were coughing, with much expectoration, repeated nose-bleeding, and profuse sweating, especially at night. At the end of the fortnight the boy improved sufficiently to get up. He had lost much flesh during his illness, and his cough and sweating continued. As soon as he could bear the journey he came to hospital, where he was admitted at the date mentioned. When first seen the patient’s aspect and pose indicated extreme depression, and there was that blush on his cheeks which, taken together with his lustrous eyes

and long eyelashes, would suggest to the observer, other things being excluded, acute tuberculosis. The temperature was 104.2° on the first night (for the next eight days the highest daily reading reached or exceeded 104°). The tongue was furred; bowels confined. Pulse about 100. A very careful examination of the lungs discovered large rhonchi merely, no dulness; no small bubbling; no physical evidence of any kind, except of bronchial flux; the sputum bronchial and uncoloured. Such was his condition on admission, and so it continued for fourteen days; a condition, namely, of extreme depression, temperature ranging daily between 102° and 104.6° ; absolute loss of appetite; sleeplessness, night-sweating, and wearing cough, with mucous expectoration, sometimes blood-streaked; the bowels being confined (except for one occasion, when they acted copiously after medicine), and the pulse seldom much exceeding 100. But what was the most striking and the most suggestive, or, as it seemed, probative of the diagnosis of tuberculosis, was that with the progress of time the patient rapidly wasted. That and the profuse sweating and prostration were the main features of the case, yet still with no more positive physical signs than those mentioned. Between the sixth and the twelfth days from admission the prostration was so extreme that it was only with great difficulty he could be raised, or indeed moved, for the purpose of examination. Yet, with an eye to possibilities, attention was continuously directed to the lungs, and it may be said positively that although bronchitis persisted, and some small bubbling was audible for a time at the left base, there was never any sign of consolidation or pneumonia. Howbeit, on the fourteenth day from admission (which would be six weeks from his first seizure and a month from the time when he had a temporary mend) signs of improvement were observed in that the night temperature fell from 104° to 103° , and the bodily weakness was less. From that day to the nineteenth a continuous progress began to open out hope of ultimate recovery. By the twenty-second day (making sixty-two days from the commencement of illness) that hope became almost assurance. The temperature had gradually fallen, and was now hardly above normal; the wasting and sweating had ceased; and, above all, the extreme bodily prostration had disappeared. With this marked improvement the catarrhal sounds within the lung underwent but little change, and on the twenty-eighth day, when he was up and convalescent, some bubbling rhonchus was audible at both bases. During the extremity of his illness it was impossible to take his weight; the only measure of the loss of flesh, therefore, is quite inadequate to express the fact. Before

his illness he weighed 7st. 10lb.; on the twenty-seventh day after admission, and when approaching convalescence, he weighed 6st. 8½lb.; a week later he had gained exactly 4lb. As regards treatment, all that it is necessary to say now is that on the 7th of June, when near his worst, and seven days before he began to mend, the boy was given ten grains of hypophosphite of soda every four hours, and this was continued for the rest of the acute illness.

In the main features of this remarkable case there are, as I think, to be found some important practical lessons—facts which are too little recognised and probabilities which are too easily set aside. Take first the fact itself. Better than all theories or precarious deductions is the knowledge which this case gives that in a tubercular subject a pyrexia of indefinite duration, which entails such wasting as almost to reach the point of emaciation, and is attended by profuse night sweats and extreme prostration, is a condition which may and which does recover. Let it be enteric fever or acute tuberculosis, or what you will, this combination of symptoms, grave as it is, as a rule fatal as it is, is not absolutely hopeless. That made certain, many other questions press for consideration. What are the probabilities in regard to diagnosis, and how are these affected by the fact of recovery? What are the particular circumstances of these recovering cases as to treatment? What is the likelihood that we may ever succeed in making recovery more common?

It has been said—the expression indeed is attributed to a very sagacious physician of our day—whenever you have to deal with pyrexia of anomalous character, the other symptoms not fitting in with any recognised pattern of disease, always put to yourself this question: “Have we here to deal with enteric fever?” But this admirable hint, so serviceable to prevent grievous errors, is not to be twisted from its real meaning. Some would put it not as a question to be deliberately decided yea or nay, but as an affirmation. Here is a pyrexia with anomalous symptoms. I cannot fit it to anything in particular; I will call it enteric fever, an affection which has so many forms that it may be fitted to anything.

Only just now, while I am speaking, we have an illustration at hand of the errors that may be committed and the valuable clinical knowledge that may be overlooked by such conduct as this. A patient in Burdett ward, with symptoms corresponding in many respects—in aspect, in temperature, in nervous prostration, in the colour and consistence of the motions—with enteric fever gets, too easily, credited with that disease. And if by any accident she had passed from our notice in the second or the third week of illness, her precise condition would take its

place in our memory as a contribution towards the full conception of the many ill-defined modes of enteric fever. But it so happened that at the end of the fourth week she died, exhibiting post mortem, not enteric fever, or any trace of it, but the most characteristic and extensive ulcerative endocarditis.

In the case before us, however, there is not the same excuse as in the other—nay, the same necessity, we may almost say—for making use of enteric fever to eke out a doubtful diagnosis. Except for febrility, this youth had nothing of enteric fever about him either in his symptoms or in their duration. We put the question as we are advised, and we answer it without hesitation in the negative. Be it what it may, the disease we have before us is not enteric fever. Proceeding, as is the custom in such cases, upon the principle of exclusion, that alternative, at all events, may be dismissed. But may we not go further, and say of this boy not only that his illness was *not* enteric fever, but that it *was* acute tuberculosis? Remember that while acute tuberculosis is very commonly mistaken for typhoid fever, the converse of this is not true. We have here the proper tubercular symptoms clearly marked out from the rest, symptoms which have been met with repeatedly in connexion with grey miliary granulations. There seems hardly room for mistake. Only when we are confidently expecting the boy's death, he disappoints that expectation and recovers.

Is then the fact of recovery to negative the diagnosis of acute tuberculosis? Of the actual deposit of tubercle it may indeed. No one, I suppose, believes that these little bodies may be thickly strewn throughout the lung in the way that we find them and the patient nevertheless recover. But there is much reason for believing that we may approach—who shall say how near?—to that pathological event and then stop short; just within the boundary, it may be, which separates extreme peril of death from the absolute certainty of it.

Did time serve I could adduce much evidence to prove that the condition we recognise clinically as acute tuberculosis is not necessarily fatal, whether occurring in youth and tending towards the lung (yet with no admixture of phthisis in the sense of lung destruction), or occurring in childhood and tending towards the pia mater. We get the very same group of symptoms in cases that are exceptional in that they recover, as in cases that form the rule in that they die; and, moreover, the earlier in life the observation is made—the nearer we get to that period when tuberculosis is seen, so to speak, in perfection,—the more does it appear that individuals may exhibit all the symptoms, not only premonitory of tuberculosis,

but which are commonly believed to announce it, and then, when the diagnosis is complete, and the prognosis seems certain, turn round and recover.

But I would ask you to look at the matter upon a somewhat broader ground. The recovery from tuberculosis, meaning by that term the clinical phenomena commonly supposed to be indicative of the deposition of miliary tubercle, so far from being rare, is a matter of frequent experience. What is rare, although less rare, I believe, than seems owing in great measure to the habitual invocation of enteric fever, is its recovery when it has passed a certain stage. We all know and teach that children of a particular conformation, whose scalps sweat at night, who grind their teeth and but half close their eyes in sleep, and so forth, are especially prone to tubercle and to death by meningitis. We advise that particular care should be taken to preserve such children from cold, from foul dwellings, from over mental application; and we insist that the first signs of pyrexia or sickness, signs insignificant with other children, need immediate attention with them. Yet, in spite of all our precautions, or for the want of them, such children get pyrexia more often than others. A certain proportion—the most tubercular, if we may so speak—will inevitably die; the rest will die or not, according to the care that is taken of them, the food they get, and the place where they live. But hardly any, until the time of their special liability is over, will escape attacks in which they will be pyrexia and waste, and show symptoms, cerebral and other, which are often absolutely indistinguishable from those that usher in a fatal meningitis.

Still more striking is the case of young adults who are tubercular. With these we know that the chief danger is not for the brain, but for the lungs; and we have strong hope that if we can tide them over the period of youth later manhood will give them comparative security. But how is it with them during this time of jeopardy? Much more than with the little children, it is apparent that they will live or not, according as their circumstances are ordered; that their life depends, that is to say, upon the conditions of living being made the easiest for them. A young man of tubercular tendencies (I am quoting from the fact) wastes, and sweats, and coughs, but with nothing discoverable in his chest beyond bronchial catarrh. Soon he is too weak to leave his room. He is advised to take a sea voyage, and to remain for a year or more in New Zealand. There he loses his cough and his weakness, puts on flesh, takes to an active out-door life as a sheep farmer, and presently, as is but natural, pining for his home and his old profession, and believing himself perfectly recovered, he returns to England.

Again there are the wasting, the cough, and the depression; and this time the symptoms are so threatening that there is grave doubt whether he can be got on board ship, or whether in his extreme state a long journey is justifiable. But once more away from the country which is not liveable for him the threatening symptoms disappear, and his health returns.

Who then, I ask, will venture to say or to write in a book at what particular stage in the tubercular fever (so to call it) all expectation of recovery is cut off; or, rather let me say, not so much expectation as possibility? It would of course be a grotesque misrepresentation of nature to pretend that such a case as ours in Burdett ward is not highly exceptional; or that with such symptoms any other result than death is to be looked for. But who is to draw the line between recoverability and irrecoverability? who is to say what particular phase or event in the clinical history represents the actual development of tubercle and seals the doom of the patient? We have ample justification, I contend, in laying down as true this proposition: in youth as well as in childhood threatened tuberculosis recovers. We can tell when such recovery is to be looked for; we can tell when it is highly improbable; we can hardly tell, certainly we cannot tell precisely, the point at which it becomes absolutely impossible.

But there is another point for consideration. Tubercular individuals, children at all events, will present the clinical symptoms of tubercular meningitis, and die in the usual way, but post mortem neither tubercle nor inflammatory exudation will be discovered. We have to reckon, then, with the following facts, and to make out of them the best hypothesis we can. There is a certain set of symptoms by means of which acute tuberculosis is commonly recognised at the bedside. Such symptoms commonly end fatally, and after death grey granulations are found in certain situations. But to this rule there are two kinds of exceptions. One where the symptoms in question do not end fatally; the other where, although ending fatally, no trace of the grey granulations is to be found.

What, then, is the hypothesis—I mean the working provisional hypothesis—which best fits this state of facts? I think it is this: Acute tuberculosis regarded from the clinical point of view is to be distinguished from the actual deposition of tubercle regarded as an anatomical fact. The early symptoms of acute tuberculosis are those which precede the actual development of the grey granulations. This latter event, analogous in some respects to the eruption of a specific fever, is preceded by certain phenomena extending over a variable period of time, during which restitution is still possible. And while, on

the one hand, the deposition of tubercle marks the termination of hope, on the other the stress of the premonitory fever which precedes that occurrence may of itself suffice to produce death.

But here the therapist steps in, and clearly there is a place for him. If his experience be large, it will furnish him with examples which will easily push aside the assertion that the acute tuberculosis which seems to recover is in fact not what it seems, but enteric fever, or something else. He has, then, only to appeal to the dogma that acute tuberculosis, pursuing its natural course, is necessarily fatal in order to reach the position he desires—the doctrine, namely, that the cure of this disease is accomplished through the agency of the hypophosphites of lime and soda. My own practice with reference to such drugs is this. In the belief that they are at least harmless, that they are commended for a class of affections very bare of remedies, and where some medicinal treatment or other is reasonably expected on behalf of those who are acutely and progressively ill, I have uniformly given the hypophosphites in every case of acute phthisis or acute pulmonary tuberculosis that has been under my care for many years. Without being at all struck with the effects of a remedy very highly commended in some quarters, I can certainly quote instances where the hypophosphites have been so far injurious that patients have improved on their being discontinued. In the present case ten grains of the hypophosphite of soda were given every four hours, commencing a week after the patient's admission. His worst and weakest time, you will remember, was the week succeeding. How far this is consistent with any curative power of the hypophosphites I leave you to determine. For myself, I believe that when cases like this one of ours are more widely recognised; when the fact of recovery is admitted not only by those who profess to have brought it about, but by others as well, who are prepared to note *all* the circumstances under which it occurs,—when that time comes the curability of tuberculosis will be found to depend not upon the hypophosphites or any other preparation of pharmacy, but upon the employment of those agencies for its cure which are suggested by the causes that provoke it. Is there no therapeutical teaching in the fact that the tuberculous children of the poor develop tuberculosis as the rabbits do, by living in impure air and damp underground cellars; or the fact that a youth of tuberculous family will escape the fate of his brothers and sisters, and the fate that over and over again has threatened himself, by removing to some better country?

Those who are the most firmly persuaded of the incurability of acute tuberculosis will not deny that there are certain well-recognised signs by means of which the tuberculous are dis-

tinguished from the rest of the community; they will not deny that there are certain localities and certain modes of living the least hostile, each for each, to the lives of such persons, and that by having recourse to such places and plans the life that is repeatedly menaced during childhood and youth may reach a healthy and secure manhood. But why need we stop here? I firmly believe that the time will come when what everybody admits will no longer be applied partially, but carried out to its full conclusion; and when it comes patients suffering like this boy whose case we have been discussing will be removed, wherever feasible, from their town surroundings, and placed without delay or fatigue in the best possible conditions for recovery upon some hill or mountain top, or, at all events, in the pure air of the country.—*Lancet*, Sept. 10, 1882, p. 427.

24.—ON PHTHISIS AND ITS RELATION TO TUBERCLE.

By REGINALD E. THOMPSON, M.D., F.R.C.P., Physician to the Hospital for Consumption, Brompton.

Of phthisis and its relation to tubercle, very different theories are held. On the one hand, there are those who believe with Laennec that all phthisis is tubercular, and that tubercle precedes phthisis; on the other hand, there are those who follow the views of Niemeyer, believing that tubercle is an accidental result of phthisis, and that the consumptive patient may become tubercular. The term phthisis should in my opinion be applied solely to those cases of pulmonary disease in which actual destruction of the lung tissue takes place. The destruction of tissue is the main feature of the disease; clinically it is recognised by the signs which indicate the formation of cavities, and it may be detected at once by the microscope, by the presence of elastic tissue in the sputa. This destructive process attacks pulmonary tissue, which from previous disease and from constitutional feebleness is unable to resist, and within this category of disease are especially included catarrhal irritation, congestion, and tubercle. In character the process is ulcerative, and follows the analogy of ulceration in other parts of the body, and I do not always understand why it should be assumed that phthisis should be preceded by tubercle, any more than that tubercle should precede all ulcerations of the intestine or other tissues of the body.

Even phthisical ulcers of the bowels cannot be distinguished in all cases from ordinary ulcerations, and the tubercular thickening and infiltration are then a secondary process. Those who believe that tubercle always precedes phthisis have never attempted to bridge over the intervening condition which alters a

process of irritative growth into one of destruction. The so-called necrosis of tubercle is not a necessity of the growth, inasmuch as we sometimes find broad bands of glistening white tubercle extending across the lung in which no liquefaction has taken place; and to say that it may suffer necrosis does not put it into a different position with other imperfectly vitalised tissue, nor does it at all explain to what the process of destruction is due. The relation which tubercle bears to phthisis appears to me to depend upon the slow chronic condition of the destructive process: it is a secondary infection, resulting from the products of altered tissue. Cases have been reported which appear to militate against the view of infection, and in which no infective focus was discovered; but in the first place, rare cases of the kind must be admitted with caution, and in the next place it is very easy to overlook even important conditions in making necropsies, and everyone who is accustomed to such work knows how easy it is to miss a primary abscess in cases of pyæmia: it may occur in the ear or in the region of the bladder, or be hidden away in some recess which is not generally searched in the ordinary course of examination. These cases ought to be put apart and considered separately, as they might lead to fresh information on the subject, but at present I cannot accept them as subverting the theory of infection. The infective virus which results from the phthisical process may be taken up in different ways by the lymphatics and the bloodvessels, leading to acute general miliary tuberculosis; or by the lymphatics only in the neighbourhood of the affected part, leading, for example, to that crop of tubercles which is often seen round a cavity; or lastly, it may be driven into the air sacs through the bronchial tubes propelled by the atmospheric pressure, and leading to that lobular form of tubercle which is seldom absent from fatal cases of phthisis. A great deal too much stress has, I think, been laid on the caseous condition of the infecting focus, inasmuch as the danger of infection appears to be proportionate to the facility with which it can be absorbed; and when caseous matter breaks down and becomes liquefied it is more ready for absorption, and capable of being more readily transferred than when in the caseous condition.

As regards the agency of the lymphatics in absorbing the infective virus, the opaque irritated condition of the lymphatics of the mesentery bear evidence to this point, and I have found in more than one case thickening to a marked extent in the thoracic duct. With regard to the distribution of the matter by the bloodvessels, it must be mentioned that pressure on the bloodvessels prevents the deposit of miliary tubercle in those parts which ought to be supplied by the impeded bloodvessels.

To give an example, I would mention a case where a patient suffering from a cavity affecting the apex of the right lung was subsequently attacked by pleurisy with effusion. Symptoms of miliary tubercle supervened upon this, from which the patient died. At the necropsy the lower part of the lung, which was pressed upon by the pleuritic fluid, was found free from the miliary tubercle, which was thickly disseminated through the upper part of the lung below the cavity, a plain line of demarcation marking off the affected district.

As regards the distribution of the matter through the bronchial tubes, I must point out that the tracts principally occupied by the lobular form of tubercle are those which are to the front and in the axillary portions of the lung, the posterior lower parts of the lung being seldom affected unless the diaphragm is adherent. There are also certain sexual characteristics in the localities affected by tubercle dependent upon the sexual peculiarities of respiration which support the theory. In woman it is not uncommon to find quite the lower part of the lung free from tubercle, the middle portion of the lung very thickly studded with tubercle. In man the base of the lung is frequently occupied, and especially towards the anterior and middle parts of the base, diaphragmatic respiration being more marked in man than in woman. The theory that tubercle is deposited in those parts which are most used, although containing some truth, is limited to the miliary form, and will not apply to the lobular form of tubercle, inasmuch as the diaphragmatic portion of the lung in man is the most active part of the lung, even under conditions of ordinary respiration. I would also say that pressure on the bronchial tubes prevents the deposit of this lobular tubercle, and that an examination of the bronchioles leading to the affected district will often show that they are in a state of extreme irritation and thickening, while those of other untainted districts are not in this condition.

With regard to the hereditary conditions of phthisis it is well to consider the analogy of other diseases in relation to heredity. In the heredity of rheumatism we know that there is a family tendency to suffer from the disease, and in some cases the tendency is confined to joint mischief, in others the heart may be especially implicated. It has also been observed that some families are especially prone to suffer from eruptive fevers, while others show a remarkable disinclination, and to quote the opinion of M. Ricord concerning syphilis there are families which appear to be peculiarly susceptible to the ravages of syphilis, while others appear almost invulnerable.

Now, in these instances I think it will not be assuming too much to say that there are two factors in the development of

disease. First, the family susceptibility, and, secondly, the exposure to a certain virus about the time of the development of the actual disease. No doubt, I think, can exist that the virus of syphilis or the zymotic fevers may be actually transmitted from parent to offspring, and the unborn child may be attacked by disease transmitted thus directly, or the disease may appear in the infant soon after birth, and in similar fashion the virus of tubercle may be directly transmitted to the infant, and cases have been recorded which appear to bear this interpretation. But susceptibility to the virus does not stand on the same footing, and in this case I presume that there are certain constitutional and structural peculiarities, the result of inheritance, which favour the development of the disease when the individual is exposed anew to the action of the virus.

As regards the development of phthisis, there are two factors which demand consideration: the first is the constitutional susceptibility as shown in the systemic disposition to give way to or permit the phthisical action, and, secondly, the structural defect in the lungs which attracts the agent to those particular organs. Not only a favourable climate is requisite but a suitable soil, the constitutional susceptibility representing the first, the feeble or devitalised structure of the lungs representing the second. The permissive yielding of the system, the absence of non-resistant power, is one of the great features in phthisis. Every-day experience of disease in all its bearings proves how an individual at one time proof against all attacks succumbs readily to disease at another, and this is true not only as regards phthisis, but also in eruptive fevers and rheumatism, the more enfeebled the body the more likely it is to develop disease.

There is perhaps no medical fact more generally recognised, even by the vulgar, than the frequent occurrence of phthisis among families, a fact fully appreciated by the actuaries and medical referees of life assurance offices, yet when search is made among the numerous writings on phthisis for some views regarding the so-called hereditary and non-hereditary phthisis, we find very little regarding any distinctions to be made between the two or concerning the exact conditions of the heredity. In fact, most authors have contented themselves with giving the relative numbers of the hereditary and non-hereditary forms, a point which, although of interest, is not of great practical use.—*Lancet*, June 3, 1882, p. 901.

25.—ON THE HISTORY OF TUBERCLE.

By the EDITOR of THE MEDICAL PRESS AND CIRCULAR.

It is impossible to feel anything but intense admiration at the marvellous skill and perseverance with which Koch's cele-

brated experiments on the etiology of tubercle have been successfully carried out. At the same time, too, we must experience the keenest regret when we reflect that the honour of such revolutionary discoveries rests with another nation than our own; and this, in all probability, entirely on account of the paralysing influence brought to bear on experimental research in this country by the noisy agitation of so-called anti-vivisectionists. The accounts already published of the observations made by Koch clearly show that he has in principle followed the method of demonstration successfully cultivated by our own inquirers in the past; and that these latter might have been beforehand in obtaining equally valuable results, had they not been inhibited through the action of an intemperate section of fanatical notoriety-hunters, is a more than probable conclusion. As it is, however, we must accept the startling discoveries detailed by Koch; and while affording them the needed verification, trust to being able to retrieve our national reputation for scientific excellence by further extending them and the applications of which they are possible.

In pursuing his investigations, Koch made use of material derived from both human and animal sources. Examination of the tuberculous material deposited in the lungs and other organs, invariably led to the discovery of minute organisms possessing all the bacterial characteristics of bacilli, and necessitated the conclusion that these forms of life are invariably present in such deposits. In young tubercle the bacilli were naturally more easily recognised; but in older material, especially in such as was distinctly caseous, their presence could not always be demonstrated, although abundant evidence of their existence was found at the edges of such accumulations. In a multitude of cases of general miliary tuberculosis, bacilli in incalculable numbers were encountered in every affected situation; and in effect it may be taken as a warrantable conclusion that they inevitably accompany the development at least of the disease. From this point, however, to a demonstration that they are also the *cause* of the degenerations which accompany their presence, is a considerable leap, the taking of which could be justified only on the accumulation of sufficient actual proof of the fact. It is the production of this proof that constitutes Koch's principal claim to the gratitude of the scientific world; and the manner in which it has been accomplished must win for its author an amount of praise such as few recent performances of a similar kind have merited.

Naturally, but one means of supplying the needed demonstration presented itself—viz., the adoption of experiments on living animals. For the purpose, therefore, numbers of guinea-pigs, rabbits, and cats were operated on, with the result, in

every case, of verifying the assumptions of the experimenter. By directly transferring the tuberculous matter from diseased animals to healthy ones, through inoculation, he succeeded in all cases in reproducing the disease; but, inasmuch as this proceeding was open to the objection that the transferred material might possibly contain a virus to which contamination was due, rather than to the presence in it of microscopic organisms, it was modified by the introduction of "cultivation" experiments conducted on a very exhaustive scale. In this connection, perhaps, more than any other, must we especially admire the unceasing perseverance of Koch's proceedings, and also unhesitatingly accept the results obtained from them. After lengthy trials he succeeded in devising a pabulum in which bacilli grew and reproduced with the utmost freedom. At the same time he was enabled to determine the conditions which were favourable and essential to their development, thus arriving at the important discovery that they grow only within a narrow temperature range of 30° to 41° C.; below the former, and above 42° , no increase took place even after the lapse of so long a period as three weeks: thus a most important distinction is to be drawn between the bacilli of tubercle and the bacilli of anthrax, the latter readily continuing the processes of active life down to a temperature as low as 20° C.

Preserving, then, his cultivation fluid at the appropriate temperature, Koch sowed a speck of tuberculous matter, and from the generation of bacilli thus produced he infected a second quantity of nutritive matter, and so on until in some cases the cultivation process was extended over as long as six months. The purified bacilli so obtained could not, by any possibility, be accused of communicating any foreign virus; and yet, when introduced into healthy animals they never failed to reproduce themselves in incalculable numbers, and to set up all the symptoms of tuberculous infection. To quote definite examples of the experiments made in this direction, it may be mentioned that four guinea-pigs were inoculated with bacilli of the fifth generation produced in 54 days from tuberculous matter originally derived from a human being. In each case the infected animal sickened and lost flesh, and being killed at the end of 32 or 35 days, strongly pronounced tuberculosis was found in every instance. The situation chosen for the injection of infective material was found to exert no influence on the result. The abdomen, the anterior chamber of the eye, and other places were selected, with always the same ultimate consequences ensuing; and in cases where check experiments were made by injecting natural, healthy blood serum into animals at the same time as others were infected with cultivated bacilli, it was found that while the latter sickened and became tuberculous, the former remained unaffected.

In another series of experiments the sputum of phthisical patients was obtained and dried thoroughly for six or eight weeks. At the end of this time, being suspended again in solution and injected into guinea-pigs, the latter became rapidly emaciated, and in every respect similarly diseased to those animals directly infected with bacilli obtained at once from tuberculous masses, or through successive cultivations. The importance of this particular observation will be at once apparent. It proves that hitherto unsuspected danger lurks in the neighbourhood of every consumptive individual, and that ordinary precautions are insufficient to protect susceptible persons from the influence of such producing agents of a dire and rapidly destructive disease. At the same time it must be assumed that it is essential for the infective bacilli to find their way into the body under certain definite conditions in order for their development and the production of tuberculous deposits to follow as a matter of course; and it is on these by no means insignificant points that further information must be obtained by means of further experimentation. Were it otherwise it would be difficult to explain the immunity, such as it is, as is enjoyed from a disease so prevalent as tubercle, for it is estimated that *one-seventh* of the total mortality arises from it. And further than this, there is a stern necessity now shown to us to admit and attempt the discovery of a means of alleviating the disastrous consequences that follow on the general distribution of tuberculous disease.

In this respect there must henceforth be no unwise or careless compromise with sentimentalism. A "foreigner," as the apostle of anti-vivisection, in his vast ignorance, contemptuously calls Koch, has contributed to our knowledge of the history of disease a discovery which bids fair to rank second in importance only to Jenner's; and on the use we may be able to make of the facts already demonstrated must largely depend the influence it may exert on the destinies of the human race.—*Medical Press and Circular*, May 10, 1882, p. 403.

26.—ON THE INFECTIVE NATURE OF TUBERCULOSIS.

By the EDITOR OF THE LANCET.

The facts and opinions which point to the infective nature of tuberculosis involve the assumption that, as regards man, the disease may arise by the inhalation of the morbid germs with the inspired air. The experiments which have in a few instances been carried out, on the artificial production of tuberculosis by the inhalation of the virus, have acquired additional importance from the recent discoveries, and it is not surprising if the attention of investigators is more and more directed to this ques-

tion. The chief observations on the subject hitherto made have been those of Tappeiner, who endeavoured to produce the disease by the inhalation of the atomised sputa of tubercular patients. Of eleven dogs subjected to experiment, all, with one doubtful exception, presented miliary tubercles in the lungs, which were found also in several cases in the kidneys, and in some also in the liver and spleen. The earliest distinct tubercular eruption was found in the course of the third week, from which he inferred an incubation period of rather more than fourteen days. Schottelius suggested that these experiments did not furnish conclusive evidence regarding the specificity of tubercle, since he succeeded in producing similar nodules in the lungs of dogs by the inhalation of various organic substances, sputum of non-tubercular persons, cerebral tissue, and even cheese. He left it undecided whether all the nodules in the lungs were true tubercles, but his experiments have at any rate this bearing on human phthisis, that the inhalation of organic substances can produce foci of disease in the lung. Tappeiner, on this, renewed the investigation. He made an emulsion of calf's brain in water, and caused two dogs to inhale the atomised liquid, but found no nodules in the lungs. He explains the difference between his results and those of Schottelius by the difference in the conditions of the experiments. Bertheau repeated Tappeiner's experiments, and obtained the same results, failing with a cerebral experiment with non-tubercular sputum.

Fresh experiments on the subject have been lately made by Weichselbaum of Vienna, dogs alone being employed. Eleven experiments were made with tuberculous sputum. The duration of the experiments varied between two days and two and a half months, and the number of inhalations between one and twenty-four. In all these cases, even in those in which only one inhalation had been administered, and the animal had been killed one or two days afterwards, tubercles were found in the lungs and kidneys, many in the former, one or two only in the latter. Moreover, the bronchial glands, and in some cases the mesenteric glands also, were swollen, and presented tubercles under the microscope. In the two cases in which the animal was killed one and two days after the first and only inhalation, the tubercles in the lungs were few and scarcely visible; but in another case, eight days after the inhalation, the tubercles, although small, were very abundant. They were non-vascular, and consisted partly of lymphoid cells, partly of cells which were larger, and flattened by mutual pressure. In the lungs desquamative pneumonia was present in places. In the centre of the larger tubercles caseation was already commencing.

In three other experiments a watery emulsion of triturated

cheese was employed in the same manner. In two, in which a strong-smelling cheese was used (Limburg cheese), the animals died, one in a month, after six inhalations, the other after two inhalations in the course of five days. The cause of death was a gastro-enteritis, and no trace of tubercle could be discovered. In the third case, however, in which mild cheese was inhaled fifteen times in the course of seventeen days, twenty-four small nodules were found in the two lungs, and one submiliary nodule in each kidney; these nodules had a similar structure to those found in the other cases. For the sake of comparison an injection of similar cheese emulsion was made into the peritoneal cavity of two other dogs, but in neither was any trace of tubercle discovered. The same negative result followed the injection of cooked tubercular sputum, whereas this, injected in the fresh state, caused a copious eruption of tubercles in the mesentery and in the large omentum. Experiments were also made with the inhalation of other substances. Pus from a carious rib, diluted with water, was inhaled for seven weeks, but only a few nodules were found in the lungs, although these had a structure similar to the tubercles of the first series. Lastly, a dog was made to inhale, sixteen times in the course of twenty days, an emulsion of fresh bullock's spleen, but no nodules were found in its organs. These experiments seem to show that tubercle-like formations may be induced by the inhalation, not only of tuberculous material, but also of other organic substances. The results, however, differ from those of Schottelius in that a difference in the action of the two classes of material was clearly shown. The tubercular sputum contains a virus which, in whatever quantity or whatever mode it is introduced into the organism, produces, without exception, numerous nodules which have the structure of tubercle. Other organic, not tubercular, substances either do not produce these at all or produce them in only insignificant quantity. Full knowledge of the mode in which the tubercle arises can only be obtained when we know to what constituents of the tubercular sputum, cheese, &c., the special effect is to be ascribed. According to these experiments the incubation period of tuberculosis produced by inhalation is much shorter than was assumed by Tappeiner, since apparently it may not exceed one day. This extremely brief interval, indeed, will cause many persons to hesitate before accepting the results of the experiments as altogether trustworthy.

The same subject has been investigated in France by M. Giboux, and in an aspect of more direct practical importance. The nocuity or innocuity of the air expired by phthisical patients was the point examined. He collected daily forty or

fifty litres of air expired by persons in the second or third stage of phthisis, and passed half this air into a hutch in which were two young rabbits born of perfectly healthy parents. Two other similar rabbits were confined in another cage of the same construction, and through this was passed daily twenty or twenty-five litres of the remaining air, but which had been filtered by being passed through tow impregnated with carbolic acid. The two cages were placed in separate rooms so as to prevent any contamination of the air of the one by the respiratory products from the other. The experiment lasted from January 15th to April 29th. At the end of this time the two rabbits placed in the second cage were in perfect health, while the others presented loss of appetite, thirst, diarrhoea, and emaciation. At the autopsy tubercles were found in the principal viscera, and the lesions in the lungs were much more advanced than in the other organs. On the other hand, the viscera of the two rabbits in the second cage presented no trace of tubercle.

Of course, as is pointed out by the *Gazette Médicale de Paris* in a comment on Giboux's investigations, the experiments do not demonstrate that the air expired by phthisical patients is as noxious to man as it appears unquestionably to be to some, at least, of the lower animals. Nevertheless, these facts are of great importance, and receive additional significance from the discoveries of Koch. They harmonise also with the cases, rare it may be, but well established, in which phthisis seems distinctly to originate in long-continued attendance on a person suffering from the disease. They raise, moreover, another question of very great practical importance. What is the effect of massing together consumptive patients in the wards of special hospitals for the disease? If the air which has been breathed by these patients manifests, by its effects, the presence of the virus of the disease, its comparative innocuity to persons in health must be due to the difficulty which the germs find in gaining an entrance through the uninjured tissue of the lungs, or to the unsuitability of the soil into which they penetrate. But these conditions do not obtain in those who are already the victims of phthisis. The suitability of the soil is demonstrated, and the lungs are no longer in a normal state. Is not the chance of recovery of such cases lessened by the constant renewal of the morbid stock of tubercular germs? No positive answer to the question can be given, but it is one which deserves most careful consideration, and observations directed to this end may soon supply at least an indication of the quarter in which an answer is to be sought.—*Lancet*, June 24, 1882, p. 1041.

27.—CONTAGIOUSNESS OF PULMONARY CONSUMPTION.

By I. BURNEY YEO, M.D., F.R.C.P., Physician to
King's College Hospital.

[Koch, of Berlin, has been exhibiting the *Bacillus* of Tubercle in the Physiological Laboratory of King's College, on which Dr. Yeo makes the following remarks in his lecture]:—

Now this demonstration, which you have seen with your own eyes, introduces you to problems in pathology and in practical medicine, the importance of which it is impossible to exaggerate. Never, in the whole of the past history of medical science and of medical discovery, have propositions been advanced of greater import than those which have been advanced and maintained in connection with this discovery.

Let me state to you, in language as clear and simple as I can, what these propositions are.

1. Tubercle is an infective malady, originating in a specific virus, and propagated by the conveyance of that virus from body to body, and originating in no other way.

2. The specific virus of tubercle consists of a particular micro-organism, found only in tubercle; this organism can be seen in the cells of tubercle, can be obtained in a separate form, and cultivated in successive generations, without losing its original properties.

3. Certain forms of disease, termed "scrofulous," are essentially tuberculous; and their characteristic anatomical morbid products contain the infective organism peculiar to tubercle.

4. The disease known as pulmonary consumption is, in the main, a tuberculous disease, and is dependent on the presence and propagation in the body of the infective organism characteristic of tubercle.

5. Pulmonary consumption is a contagious malady.

Of these five propositions, it is claimed for the three first that they rest on demonstration, as I propose to show you; the last two are, more or less, of the nature of inferences from the three preceding; and in connection with these, we may expect to find there will exist some differences of opinion.

The idea that consumption is a contagious disease is not a new one. It is a doctrine which has always been maintained in the south of Europe—in Italy, Spain, and Portugal. Galen believed it, Morgagni believed it, and great names in the history of medicine, from their time to ours, may be found both for and against it.

Pidoux, in France, who had unusual opportunities of becoming acquainted with the histories of a large number of consumptives, declared that his own experience was directly opposed to this doctrine; and that he had never seen a single case of consumption that he could refer to contagion.

One of the most distinguished physicians of our own times, formerly Professor of Medicine in this college, Sir Thomas Watson, in a course of lectures delivered in that very college where you have recently seen demonstrated the existence of a tubercle-bacillus, thus expresses himself on this subject.

“Is phthisis contagious? No; I verily believe not. A diathesis is not communicable from person to person. Neither can the disease be easily (if at all) generated in a sound constitution. Nor is it ever imparted, in my opinion, even by one scrofulous individual to another.”

From my own experience of consumption—and, as I shall show you presently, it has been a very large one—I cannot doubt that this was the judgment of sound common sense at the time it was uttered, and with such evidence as was then, and has been until quite recently, attainable. But it would be unscientific now to tie oneself to this opinion, in the face of such facts as recent researches in experimental pathology have established.

On the other hand, another very eminent physician, a brother of another former Professor of Medicine in this College, Dr. William Budd of Bristol, long ago promulgated the view that pulmonary consumption was a disease “strictly analogous to the ordinary eruptive fevers in everything but the slowness of its progress; that, among European populations, tuberculous disease had undergone mitigation of its original severity by long prevalence; but he entertained no doubt of its eminently contagious character.”

We must not be surprised that Dr. Budd’s views met with little acceptance at the time. Insight, however penetrating, is not demonstration, and scientific belief rests wholly on demonstration. Then (and even now), the evidence, derived from practical experience, against the contagiousness of consumption, in at all the same sense as smallpox and scarlet fever are contagious, seemed overwhelming; and, if we yield now to the teaching that phthisis is a contagious disease, we shall yield solely to demonstration and experiment. For such evidence as we obtain from the experience of physicians in their practice amongst consumptive patients affords, at most, but a weak presumption; and the facts I shall bring before you certainly show that consumption is by no means contagious in the sense which is ordinarily and popularly attached to that word. But the modern methods of experimental research are, doubtless, destined to widen our conception of “contagion,” as they have widened and corrected our conceptions in respect of many other pathological doctrines; and it is quite possible that, under certain given conditions, consumption may be a contagious disease.

The tubercle-bacilli appear as "delicate rods from a quarter to half the diameter of a blood-corpuscle in length"; that they have been found "in large numbers in all places where the tubercles are of recent formation and spreading rapidly, more especially at the border of the cheesy masses." They possess a special relation to the giant-cells, being found in their interior sometimes to the number of twenty in each cell. They do not appear to possess any power of movement. In some of the rods, oval spores have been seen. They have been seen in the human subject in cases of miliary tuberculosis, in cases of caseous broncho-pneumonia, in tubercle of the brain, in intestinal tuberculosis, in freshly extirpated scrofulous glands, and in certain cases of synovial degeneration of joints. Nor need I repeat the account (already published in this Journal) of the beautiful series of experiments by which Koch has shown that it is to the presence of this organism, and to this alone, that tubercle owes its infective property. One fact, however, let me mark, *en passant*, for future comment. "It was found that these bacilli required a temperature approaching that of the human body for their growth." The minimum temperature of 86° Fahr., and the maximum of 104°, are the limits between which they can develop and multiply. This disposes of the first and second propositions, and brings us to the third, viz., "that certain forms of disease termed scrofulous are essentially tuberculous."

Both the experiments of Koch, as well as those of Dr. Hypolyte Martin, go to establish this proposition. I have just said that Koch has found the infective bacillus of tubercle in freshly extirpated scrofulous glands, and in certain cases of (scrofulous) degeneration of the synovial membrane of joints. And Dr. Martin has obtained a series of cases of generalised tuberculosis, by successive inoculations in guinea-pigs; the original inoculations being in one instance from a small collection of pus found, after death, in a firmly encased submaxillary gland of a child, who had died of measles and broncho-pneumonia without any trace of tubercular disease, but with well marked clinical characters of scrofula; and in another, from non-degenerated (non-caseous) scrofulous products, a few instants after surgical removal.

Dr. Martin suggests, however—and the suggestion seems to me a sound and practical one—that scrofula is, perhaps, not a distinct morbid type, and that some of its manifestations must be included under the class of tuberculous diseases, and that others belong simply to the "lymphatic constitution;" that the possession or non-possession of the property of infection, capable of being transmitted through a series of inoculations, affords the only elements of a certain diagnosis, or, as Koch would

probably say, the presence, in their characteristic anatomical elements, of the tubercle-bacillus.

The fourth proposition, that pulmonary consumption is, in the main, a tuberculous disease, will no doubt be stoutly opposed by many in this country, who have adopted those views of the origin of pulmonary consumption in ordinary inflammatory processes which have been so ably advocated by Niemeyer; and much additional experimental research will be necessary in order to set this question at rest.

At present, this proposition rests on the observation that fresh caseous matter, as well as the grey granulations found in the lungs of phthisical patients, are infective, and contain in their anatomical elements the tubercle-bacillus, and that the sputa of phthisical patients are infective; whereas the caseous degenerated products of ordinary inflammation are not infective (in series), and do not contain the characteristic micro-organism.

But it is not denied that chronic inflammatory changes may be produced in the lungs by the entrance of various irritating foreign particles, and that these changes may in time produce fatal injury to the organs of respiration; it is, however, suggested that these cases should not be spoken of as phthisis, but as forms of chronic pneumonia.

In conclusion, we again come to the fifth and last proposition, the proposition with which we started, that pulmonary consumption is a contagious malady. I must again say that it is impossible to over-estimate the importance of establishing the truth or error of this proposition.

It is precisely one of those questions upon which the Collective Investigation Committee of the British Medical Association may be expected to gather up valuable information. And it is one also which can scarcely be cleared up without prolonged and repeated investigations by means of experiments on animals; not painful experiments, happily; there is no need to give pain in carrying out the kind of investigations which this subject demands, and which are calculated to promote the welfare both of man and animals. There are, moreover, many matters of daily concern connected with this investigation; the way, for instance, in which consumptive patients should be tended and nursed; the propriety of massing together a great number of consumptive patients in the same building; the propriety of allowing healthy persons to breathe air contaminated by the breath of such patients; the mode of dealing with their expectorations; the kind of medical, climatic, or other treatment best suited to the arrest and cure of the disease, regarded as an infective malady; the marriage of consumptive patients. Supposing consumption to be, under certain conditions, a contagious

malady, there seems to be, *primâ facie*, some ground for believing that one of those conditions may be that of temperature—the temperature of the body, or the temperature of the external air.

I have already mentioned that in the South of Europe consumption has always been looked upon as a contagious disease. May this not be owing to the relatively higher temperature of these regions? And we naturally associate with this reflection Koch's statement that the tubercle-bacillus requires a temperature above 86° Fahr. for its propagation.

I must content myself at present with simply pointing to this question of the influence of temperature upon the origin and propagation of consumption, as one which requires careful investigation. I shall have something to say in a future lecture on the antiseptic treatment of consumption. Finally, there is the pressing question of the possibility of conveying tuberculous disease to children by feeding them with the milk of consumptive cows; but I have said enough I hope to convince you of the truth of the statement I made at the commencement of this lecture, that it is impossible to exaggerate the importance of the subject to which I have now called your attention.—*British Medical Journal*, June 17, 1882, p. 895.

28.—ON THE ANTISEPTIC TREATMENT OF CONSUMPTION.

By I. BURNEY YEO, M.D., F.R.C.P., &c.

If the expectoration, if the matters discharged from the air-passages of a phthisical patient, swarm with infective micro-organisms, as we are assured on the highest authority is the case; if the active invading area of the diseased portion of the lung be also crowded with these same infective bacilli, what treatment can be more rational and more appropriate than that which aims at destroying the life and activity of these organisms? indeed, I might ask, what treatment can be rational or appropriate which neglects to follow this indication? The only questions that admit of argument in connection with this subject are these two: 1. Are we satisfied that the presence of these infective organisms in phthisical lungs, and their causal relationship with phthisis, have been demonstrated? And, 2. Have we the means of treating this disease antiseptically—that is to say, do we possess, in an applicable form, the agents which will destroy these micro-organisms, and so arrest the progress of the disease?

If in phthisis, as seems most probable, we have to do primarily with a specific virus or infective organism, and secondarily with an inflammatory process excited by it, our treatment must have a twofold object—the destruction of the

virulent agent, and the reduction of the accompanying inflammation; and, in actual practice, my own experience certainly shows that the best results follow the combination in treatment of these two ends.

If we look through the whole of the literature dealing with the treatment of phthisis, it seems to me that two facts start out in remarkable prominence: one is the value of treatment which may be regarded as antiseptic—sea-voyages, mountain air, dry pure air in any locality, sulphur waters, terebinthinate vapours, iodised vapours, &c.; and the other is the value of counterirritation, systematic and continued counterirritation; treatment, you see, directed against a virus or an infective property—treatment directed against the results of present and past inflammatory action. But we must not expect more from antiseptic treatment than it can possibly yield. I have seen it remarked that cases of phthisis, though they might be benefited, are not cured, by antiseptic treatment. To this, I would reply, that aseptic and antiseptic treatment, if it do not cure, is, at any rate, an essential condition of cure, where cure is possible. Nature often herself erects an antiseptic barrier against the invasion of septic agents. And one of the most universally admitted remedies for staying the progress of phthisis is the removal of the patient to some place where he shall breathe an aseptic, if not an antiseptic, atmosphere. It is foolish to expect that antiseptic agents can act, so to speak, retrospectively. Water may extinguish fire, and stay its ravages, but it cannot rebuild what the fire has destroyed. So antiseptic agents may arrest the activity of septic influences, but they cannot undo the mischief that is already done.

When I read of hospital physicians vigorously plying, with so-called antiseptic sprays, patients in the very last stage of phthisis, with lungs riddled with cavities, and then reporting that they have arrived at “decisive negative results,” I am amazed to think that they ever imagined it possible that they could arrive at any other.

It is not a little instructive in connection with the history of this subject to find Dr. Copland, many years ago, recording the fact that a young man, who had repeatedly come under his observation in an advanced stage of phthisis, completely recovered his health after he had been for a considerable period employed in the manufacture of creasote; and at the end of his *Historical Sketch of the Treatment of Pulmonary Consumption* he observes:—

“The inhalation of the fumes of tar or of creasote, or of the terebinthينات, very weakly diffused in the atmosphere breathed by the patient, is in some cases beneficial in impeding the advance of tubercles or the formation of cavities, and in healing the surfaces of cavities which have been formed.”

Valuable testimony has been given by Dr. Lemaire and Dr. Sansom as to the efficiency of the inhalation of "carbolic air" in phthisis. Dr. Lemaire gave carbolic acid also internally in aqueous solution. He found very remarkable effects follow its use. There was diminution of cough after twenty-four hours, and in some cases almost a complete disappearance after a few days. The expectoration was diminished or almost suppressed, and if the sputa were offensive, their foetor disappeared. In many, the physical condition of the respiratory organs was ameliorated. Some were cured, in others there was a subsidence or disappearance of *râles*, and parts became pervious to air which had previously been impervious. In other cases he had noticed increase of strength, return of appetite and sleep, increased freedom of breathing, and general exhilaration.

Dr. Jaccoud, the eminent Professor of Medicine in the Faculty of Paris, in a treatise which he published last year on the Curability and Treatment of Pulmonary Phthisis, thus testifies to the good effect of creasote given internally. The "pure creasote of the beech-tree" is the preparation used by preference in Paris. "This remedy," he says, "more rapidly and more surely than any other diminishes the expectoration and limits the extent of the catarrhal lesions, and thus reduces considerably the area of the pulmonary changes. But that is not all; and I am induced to believe that creasote may act on the *fundamental lesions themselves, the tuberculous lesions*, and promote indurative changes, which, as you know, is the method of cure." He mentions the case of a young girl twenty-two years of age, who was in the hospital three months with infiltration and softening at the left apex; and, after the creasote treatment, she became greatly benefited, and was discharged fifteen pounds heavier. The signs of "peritubercular catarrh" had disappeared; the dulness had greatly diminished; and breath-sounds had to some extent reappeared. She remained in good health for two years, when she was readmitted with an attack of broncho-pneumonia from exposure to severe cold. She was very ill, but recovered to some extent; and when convalescent, she was obliged to leave the hospital and was lost sight of.

In another case quoted by Jaccoud, of a young Russian thirty years of age, he observed the area of infiltration and softening at the apex of one lung diminish one-half under the creasote treatment. "This amelioration has lasted two years, and is still maintained; and the state of the patient's general health is particularly good." He considers creasote a "precious medicine," and it now forms a "fundamental part" of his treatment. His method of giving it is to begin with a very small dose, to increase it very slowly, and to maintain its administra-

tion for a very long period. He never gives at the commencement more than three minims in the day, often less, increasing by one minim every ten days, rarely exceeding five minims, and never exceeding six. He wisely objects to its being taken pure in capsules, on account of its irritating effect, in this concentrated form, on the gastric mucous membrane. He prefers that it should be added to the cod-liver oil, if the patient take this ; if not, that it should be given in glycerine. He has found that the addition of creasote to cod-liver oil has often had the effect of enabling patients to take the latter, who were unable to do so previously ; adding to the dose one drop of essence of peppermint. His formula for creasote in glycerine is as follows : Glycerine, 10 drachms ; brandy or rum, 2 drachms ; creasote, 3 to 6 minims ; a third of this to be taken three times in the day.

Besides the internal use of creasote, Dr. Jaccoud is in the habit of recommending the inhalation of a spray of carbolic acid in cases where the disease has advanced to the formation of vomicae, chiefly with the object of preventing the absorption of putrid secretions and *débris*. But it seems practicable to obtain the good effects of antiseptic agents without the necessity of using a spray, which entails a certain amount of trouble, and can only be applied occasionally ; whereas, I recommend that antiseptic inhalation be applied continuously.

Now there are many antiseptic substances, the vapour of which may thus be continuously, or almost continuously, diffused into the air that is breathed. Your choice may depend somewhat on the taste of the patient ; or you may change the applications, from time to time, until you find out, in each case, which is most useful, and best supported by the patient.

Some simply keep the sponge (or tow) moistened with carbolic acid ; others prefer creasote, and others use spirits of turpentine. I have used all these alone, as well as in combination. I have also used eucalyptol, thymol, terebene, camphor, fir-wood oil (*oleum pini sylvestris*), solution of tar in rectified spirit, tincture of benzoin, tincture of iodine, &c. Of all these I prefer creasote ; but I also frequently use carbolic acid and eucalyptol, with which I sometimes mix a little camphor. Turpentine is a useful addition as an astringent, where there is profuse secretion or a tendency to hemorrhage. Camphor has been said to be a very powerful antiseptic, but it has the objection of diffusing itself very rapidly, and is unpleasantly pungent and penetrating. I have also found it a very convenient plan to mix these substances, such as creasote, carbolic acid, eucalyptol, or turpentine, with equal parts of spirits of chloroform. It helps to diffuse and vaporise these substances, and it is itself somewhat of an antiseptic ; and it has

also a soothing effect on the often irritable bronchial mucous membrane. I have often seen a patient tormented with cough at night, so much so as to be unable to get any sound sleep, obtain perfect relief from this distressing symptom by using at bedtime one of these inhalations in an instrument of this kind. The quantity required for this purpose is often quite inconsiderable; it is rarely necessary to use more than twenty minims of a mixture of equal parts of creasote and spirits of chloroform dropped on the sponge at a time, and renewed occasionally as it becomes exhausted; and it is often desirable to begin with very small quantities, until the patient gets used to the vapour. Five drops of the mixture may be dropped on the sponge at a time, and gradually increased to fifteen or twenty. One of the advantages of the little inhaler I have described to you is that, being perforated all over, the access of air is unimpeded, while the vapour diffuses itself freely into the immediately surrounding atmosphere. With more solid inhalers, patients will often say they feel "stifled," and refuse to use them.

The substances I have named are, I believe, the best for continuous, or almost continuous, inhalation; for occasional inhalation you will find a weak iodised vapour often very useful; and even a very dilute chlorine vapour is well borne by some patients. But in these matters, as I have already said, you must consult in some measure the tastes of your patients.

Iodine vapour may be diffused through a room or small chamber by throwing fragments of iodine on a heated plate, as I now do; or it may be inhaled from the surface of hot water, by pouring a few drops of tincture of iodine on the top of hot water contained in a suitable vessel, and holding the mouth and nose over the vapour, with some light covering over the mouth and nose and vessel. The vapour of tar may be inhaled in the same manner. A sleeping apartment may be impregnated with tar vapour by putting some tar on a heated metal plate, or stirring a vessel containing tar with a piece of heated metal of any kind. Other antiseptic substances which are not volatile or are vapourised with difficulty may be inhaled in solution in the form of spray. A Siegle's spray-producer is the instrument usually employed for this purpose.

A substance which has been given in Germany, and recommended as an antiseptic in cases of tuberculosis by Dr. Max Schüller of Greifswald and Dr. Rokitansky of Innsbruck, is the benzoate of soda. This they give in the form of spray, *i.e.*, the two to five per cent. solution in distilled water. But the great objection to this mode of treatment was the amount of fluid it was necessary to inhale (twenty ounces of a five per cent. solution daily) in order to take in the minimum dose. The patient

would have, as indeed Dr. Max Schüller says, to devote his life to his cure; for you cannot inhale a spray and do anything else at the same time, whereas the inhalation of an antiseptic vapour by the method I adopt can be continued at the same time with almost any other occupation.

I have adopted this plan of treatment in a great number of cases, and in nearly all of them it has been attended with conspicuous benefit. Even in somewhat advanced cases, it allays the cough, lessens the amount of expectoration, and diminishes the fever.

But there is another antiseptic method of treatment which has come into general reputation within the last ten or twelve years, and of the advantage of which in certain cases there can be no kind of doubt. I allude to the removal of consumptive patients to the dry, pure, cold air of elevated regions. The low temperature of these regions may have much to do with limiting the vitality and propagation of the tubercle organisms. But I have gone into this question fully elsewhere, and I need not go over that ground again here. I will, however, refer to a remarkable passage in a letter from a well known resident in one of the chief of these resorts, Davos Platz, which seems to me to have great significance with regard to the question of the contagiousness of consumption. Speaking of the overcrowding that has taken place in that locality, he says: "The tendency at Davos has been . . . to pack the patients together in as small a space as possible, and to build new inns at the doors of the old ones. All this is done in a climate where winter renders double windows and stove-heated buildings indispensable. All this is done for a society where the dying pass their days and nights in closest contiguity with those who have some chance of living. Within the last few weeks, two cases have come under my notice; one, that of a native of Davos attached to the service of the visitors; another that of an English girl, who have both contracted lung-disease in the place itself, owing, as I believe, to the conditions of life as they have recently been developed here." (Mr. J. A. Symonds in the *Pall Mall Gazette*.)

Now if the infective character of tuberculosis were generally recognised, and the tuberculous nature of pulmonary consumption generally admitted, mistakes of this kind would hardly be committed. So, again, the antiseptic influence of sea-voyages is greatly interfered with by the unavoidable occurrence of bad weather necessitating the confinement of the invalids in close overcrowded cabins, in which the atmosphere they may have to breathe, for days and days together, is anything but antiseptic.—*British Medical Journal*, July 1, 1882, p. 7.

29.—ON THE GERMICIDE TREATMENT OF PHTHISIS.

By the EDITOR OF THE MEDICAL TIMES AND GAZETTE.

In coming to apply the germicide treatment of phthisis, we are reminded as practitioners of a circumstance that we are apt to forget as pathologists, or rather as etiologists. It is, generally speaking, easy to kill rats in a house; the only practical difficulty is that they take the poison and then retire to the recesses of their holes to die, so that they become almost as disagreeable when dead as they were when living. But the trouble arising from micro-organisms left dead in the tissues is too infinitesimal to be dwelt upon; the real contrast with the homely case that we have chosen is that the parasites are not vermin lurking in a house made with hands, but organisms deeply involved in the tissues of a living body. It is far from clear at present that the means which are adequate to kill the parasite may not be more than adequate to kill the patient. Dr. Ehrlich, who has made the latest observations on the bacilli of tubercle, communicates a fact which has, as he says, a bearing upon the kind of disinfectants to be used. The bacillus of tubercle, although it does not differ from other bacilli in its interior substance or as regards its staining properties, is provided with an outer case or shell, which is remarkably impenetrable to a certain class of substances. Strong nitric acid diluted with two parts of water serves to blanch all other matters in the preparation, but it does not penetrate the almost chitinous encasements of the bacilli. Although nitric acid of that strength has no little corrosive power, it by no means follows that there are not substances in nature with a more special toxic affinity for the bacilli, with a more subtle power to pierce between the joints of their armour. But the resistant outer coat of the bacillus is, at any rate, a factor that has to be reckoned with. Next we have to reckon with the favourite seats of the bacilli. They are often in the interior of cells; and in bovine tuberculosis, so far as we know, they are nearly always in the interior of giant-cells. They are, at all events, in the interior of nodules, and of nodules that are to a notorious degree cut off from the blood-supply. Still further, the nodules are apt to be distributed through a wide range of organs and parts, from the brain even to the bones. The dispersion of syphilitic gummata by means of iodide of potassium is perhaps an analogy; but it is an analogy that carries us back to the purest empiricism, and syphilitic gummata are apt to be much less numerous and much more passive than tubercles. The cases of widespread tuberculosis are probably the last that will yield to the germicide treatment; the assault will first be made upon the ordinary and too

common cases of consumption—the cases that flock to the Brompton Hospital—the cases of phthisis of the lungs.

Inhalations are the natural vehicle of pulmonary germicides, and inhalations have been already much resorted to in the earlier and ruder times of empiricism. Medicated vapours of various sorts were well known to the practitioners of the last century, and even of an earlier time; coming down to sixty years ago, we find a work published in 1823 by Crichton, “On the Treatment and Cure of Pulmonary Consumption, and on the Effects in that Disease of the Vapour of Boiling Tar”—a disinfectant vapour. It may be that we shall return to those practices, now that they have ceased to be empirical; and it may be that faith in their soundness will procure for them a more patient trial, and lead to a more appreciable success. We have already mentioned the indication of treatment derived from the observations of Ehrlich; no disinfectant with an acid re-action—a sweeping exclusion—need be tried, inasmuch as the outer coat of the bacillus is impenetrable to even strong acids. Alkaline disinfectants are of most promise; but, when we call to mind all the circumstances of the bacilli in the tissues, we should not be too sanguine. It is not always an easy matter to eradicate the relatively large and relatively accessible fungi of tinea or pityriasis, and the bacilli of tubercle are many times more subtle, and infinitely more closely identified with the very life of the tissues. It looks as if it might be easier to destroy the delicate living mechanisms of the patient than to destroy the crass vitality of the parasite. If there are such limitations imposed upon the germicide treatment, they are grievous to all alike, whatever our various pathological leanings may be; but, to those who see so much in the tubercular bacillus, the fact of there being such limitations may perhaps serve as a gentle reminder that the living activities of the body must also be reckoned with in the etiological theory and in the therapeutical practice. The parasitologists have been somewhat too apt to leave out of account the reactions and predispositions of the body or of the living tissues; they have essayed to reach the external causes of disease without giving heed to the usual nosological considerations. But in the hour of treatment it is impossible not to think of the seats as well as the causes of maladies.

The most useful indications from parasitology will doubtless be in the way of prophylaxis. Dr. Koch has indeed already directed attention to the dangers arising from dried phthisical sputa becoming mixed with the dust of the air, and he has suggested that the expectorations of the phthisical should be summarily reduced to an innocuous condition. Here also the inevitable empiricism has forestalled the conclusions of science;

it has been an immemorial practice in Italy to disinfect everything in a house where a consumptive has died, and even to destroy articles that have presumably been contaminated. Relatives who accompany those unfortunate patients in search of health have occasion to know the Italian practice, and they have been apt hitherto to set it down as a meaningless and costly superstition. The only other practical suggestion that has arisen out of the parasitic theory of tuberculosis is that we should look after our milk supply, lest the milk of tuberculous cows should be mixed therewith. Various facts and arguments bearing on that danger had been plied for some time before the bacillar theory came out; and it is not easy to see why the presence of bacilli in the milk—if, indeed, they *are* present in the milk—coming from a tuberculous cow, should serve to bring home to the hearts and minds of men a danger that they did not appreciate on the strength of considerations less microscopic. But such effect the bacillar discovery seems, at any rate, to have had, directly or indirectly.—*Medical Times and Gazette*, June 3, 1882, p. 584.

30.—ON CONTINUOUS LOCAL MEDICATION OF THE LUNGS IN PHTHISIS.

By G. HUNTER MACKENZIE, M.D., Physician for Diseases of the Throat, &c., to the Western Dispensary, Edinburgh.

If we accept the view, the evidence in favour of which is being daily augmented, that in phthisis we have a disease due to a septic or parasitic organism which finds ready ingress to the lungs and develops in the pulmonary secretions of its victims, it may be matter of surprise that phthisis, common though it be, is yet not more widely encountered. For the pulmonary exhalations of a phthisical patient must be literally swarming with these organisms, and the atmosphere of their apartments must be largely contaminated with them. But in accordance with the general law which seems to govern the development of such organisms, a certain amount of preparation on the part of the individual is necessary before his lungs become suitable soil for their development. His receptivity requires cultivation, and this appears to be the rôle played in the process by the so-called constitutional tendency; it acts as the pioneer of the disease, but does not, of itself, induce it.

Now, the bearings of the preceding briefly-summarised views upon the therapeutics of the disease seem clear and decided. Holding the doctrine of a local infection, we have necessarily abandoned the view of a general disorder manifesting itself in local disease, and have arrived at the conclusion that this loca-

lisation is the primary cause of the affection. The indications, therefore, for local (antiseptic) treatment of the lungs in phthisis appear obvious. Not only so, but should the primary (infecting) disease be located elsewhere than in the lungs, to this region must the local treatment be directed. A case, for example, has recently been recorded by Bryant, in which phthisis was associated with and, as the result showed, dependent upon, suppuration of the knee-joint, and in which, after amputation, recovery with disappearance of the chest symptoms took place.

But the class of cases to which attention is invited in the present communication is the very large one in which the primary, or infecting, disease is situated in the lungs themselves. In the attempt to carry out local treatment, recourse may be had to surgical means, such as tapping, drainage, and antiseptic injections, and satisfactory examples of this method of treatment have been recorded by Douglas Powell, Williams, Cayley, and others. It is obvious, however, that this method is inapplicable to the earlier stages of phthisis, and, under any circumstances, it requires to be very carefully gone about, and carried out only under the guidance of accomplished diagnosticians. In the method of the continuous inhalation of such volatile substances as possess antiseptic qualities we have a ready and efficient means of acting on the lung and its contents, and it is to this system to which I now venture to direct attention.

Mindful of the nature of the disease with which we have to cope, our efforts in the direction of local medication of the lung to be effective must be applied with continuity and steadiness, and, if possible, in such a way as not to interfere with the normal method of respiration. I attempted to comply with these conditions by filling the rooms occupied by patients with antiseptic fumes, but without success. The only other method seemed to me to design a medicated respirator which might be carried about and worn by the patient, and so admit of comparative continuity of use. The instrument, which I have designated the naso-oral respirator, was accordingly introduced, and as it is already well known to the profession any detailed notice of its construction and mechanism at the present time is quite unnecessary. It is needless, however, to state that it fulfils conditions which intermittent spraying or the inhalation of medicated steam can never do. The fluids used for inhalation purposes belong to the class of volatile antiseptics, such as carbolic acid, creasote, terebene, eucalyptus oil, &c. In ordinary cases I prefer a mixture of creasote (three-fourths) to carbolic acid (one-fourth, Calvert's No. 1). This is, as a rule, wonderfully well borne even in the case of children.

I have already briefly reported the case of a child, *æt.* 7, who inhaled pure creasote almost continuously for several weeks without difficulty or inconvenience. This child, it may be added, now continues well and strong, and has not inhaled for over a year. Eucalyptus oil, though bland and unirritating, is very apt to produce sickness and nausea. Toxic symptoms have never been noted in any of my cases after the continuous inhalation of carbolic acid or creasote for prolonged periods, nor have I heard of a single instance of their occurrence in the practice of other practitioners. The urine generally remains free from traces of the antiseptic inhaled, but on two or three occasions very minute traces of carbolic acid have been found after the use of this drug.

The results obtained from continuous inhalation in suitable cases—and most cases appear to derive benefit to a greater or less extent—are manifested in a decrease of the pyrexia, cessation of night-sweats, improvement in appetite, and increase in weight. In accordance with Ringer's proposition, we are justified in gauging the measure of progress in phthisis by the thermic curve, though it is fair to note the fact that such an experienced clinician as Theodore Williams maintains that tubercle may form in more than one organ without giving rise to any marked rise of temperature, and, in fact, with sub-normal temperatures. Experience seems to be rather against the general acceptance of this latter view, and I think we are still justified in considering the fever and emaciation, represented by the temperature and weight, as the true measure of the patient's progress. A case of acute phthisis, illustrated by a complete series of temperature charts, has been recorded by me, in which it was experimentally shown that, on commencing creasote and carbolic acid inhalations the temperature fell, the night-sweats ceased, and the appetite improved, only, however, to return on the discontinuance of the inhalations. On resuming treatment the same results accrued as on the first occasion. This patient is still under my notice, and continues well without requiring to practice inhalation. He has increased in weight fourteen pounds within the last year. I have repeated these experiments in other instances, and carefully noted the results, and am satisfied that antiseptic inhalations, continued for sufficient periods of time, have a decidedly antagonistic action to the tubercular virus. I am inclined to believe that better results are obtained in what might be called specific cases proper, in contradistinction to chronic inflammatory ones. The former are characterised by all the features of fever, symptoms from which the latter are, to a great extent, free.

But besides the applicability of this system to cases of acute specific febrile phthisis, it seems probable that local medication

of the lung is likely to prove beneficial in certain allied conditions, for instance, bronchierictasis. As stated by Theodore Williams, the commonest form of death in this disease is from septicæmia, some of the decomposing material being inhaled into the sound lung and setting up fatal septic pneumonia. What better method of obviating this than by the careful and constant application of antiseptics to the lungs?

The contraindications to the employment of continuous medication are laryngeal complications, hemorrhage, and great destruction of lung-tissue. In laryngeal phthisis, strong inhalations have a very irritating and drying effect on the throat, and here it is better to discontinue them entirely, or reduce the strength of the inhalant by the addition of three or four parts of rectified spirits. I am of opinion that, in two or three instances, I have noted an aggravation of hemorrhage after the use of the naso-oral respirator, so now I make it a point to have all bleeding stopped before commencing continuous inhalation. The undesirability and inutility of torturing a patient with extensive lung destruction by the superaddition of a system of treatment at the eleventh hour, which, under the circumstances, might prove troublesome, merely require passing notice to be avoided.

In regard to adjuvants, the usual attention is required to cleanliness, ventilation, and pure air. In the prophylaxis, as also in the treatment, of the disease, it is to be borne in mind that the lungs are readily influenced by dampness both of the atmosphere and the soil, more particularly the latter. A moist climate with a high or a quickly-changing temperature predisposes to lung disease. Intense cold, if associated with dryness of the atmosphere, has no predisposing effect. An interesting example of this was Sir Allen Young's Esquimaux, who became phthisical on his removal to a southern clime, and recovered on returning to his native cold. Confinement and sedentary occupations should be avoided, for they predispose powerfully to the disease and aggravate it when existent. In Switzerland, for instance, the mortality from phthisis in the case of those following out-door occupations is only about one half of that occurring amongst the in-door section of the population. The dieting of the patient is of importance. Struck by the fact that tuberculosis is more common and can be more readily artificially induced in herbivorous than carnivorous animals, I have, for some time back, forbidden the use of vegetables in phthisis. Lately there has been published a most interesting and valuable report by Mr. Spears (Local Government Board) in regard to the outbreak of woolsorters' disease at Bradford. Knowing the predilection of the anthrax contagion for herbivorous animals, and remembering the experiments of Feser, who found that

rats on a flesh diet could not be inoculated with the disease, whilst the same rats, when fed with vegetables, were readily inoculated and rapidly died, Mr. Spears was led to inquire minutely into the circumstances attendant upon the outbreak of the disease in individual woolsorters. He found that, in almost every instance, its development dated from a Saturday or a Sunday, being coincident with, or immediately following, the feast of vegetables and herbs which the operatives generally indulged in on those two days. I am inclined to believe that the virus of tubercle has, in the manner of its development, certain resemblances to that of anthrax; at any rate, of this I am certain, that tubercular patients thrive better on a nitrogenous than a carbonaceous diet. Dr. Clelland also found alcohol, a carbonaceous compound, to be prejudicial in phthisis, and he attempts to account for this on the ground that phthisis is a disease with diminished respiration, and consequently a diminution in the amount of carbonic acid excreted, which becomes aggravated on the administration of alcohol. Some interesting experiments might be performed in regard to this point, but as the paternal government under which it is our good fortune to live has wisely decreed that these shall not be permitted except under troublesome and harassing conditions, their prosecution must be left to the enterprising spirits of other nations. With continuous medication the internal administration of drugs is seldom required. Those who have faith in the efficacy of cod-liver oil may use it, though I believe its indiscriminate and prolonged use frequently does harm by upsetting the stomach, and also by contributing towards the fatty degeneration of organs. With implication and softening of lymphatic glands, the best remedy is the chloride of calcium, given in ten grain doses in the manner recommended by Sawyer.—*Practitioner*, August, 1882, p. 94.

31.—ON SULPHUROUS ACID VAPOUR IN CONSUMPTION.

By Dr. D. H. CULLIMORE, Physician to the N.W. London Hospital; formerly Medical Staff, Indian Army.

Having been long convinced, as shown by my writings published in 1880, of the contagious character of pulmonary consumption, a fact which the recent discovery of the tubercular bacillus most clearly demonstrates to the satisfaction of the most sceptical, I have lately been occupied in testing the relative merits of the various antiseptic agents as inhalations in this disease, mainly with a view of finding out one that might prove an antidote to its specific poison. I believe, for reasons which I will bring forward as I proceed, that such an antidote will be found in sulphurous acid, or the vapour of sulphur

administered in combination with other drugs, so as to minimise or entirely counteract its irritative properties, and disagreeable odour. However, as when the most universally accepted antidotes are limited in their action, and their success or failure determined by the intensity of the poison or its duration in the system, so will similar conditions influence the remedial action of any antidote to the ravages of the tubercular bacillus. Thus, it must not be imagined from the discovery of the bacillus of Koch that the direct application by inhalation of the most suitable remedy will at once, and in every case, be followed by a cure. Those who expect this will assuredly be disappointed, no such beneficial revolution can be accomplished, particularly in a chronic disease, where every stage is bound up with inflammation, and whose whole pathology may be briefly and correctly summed up as a combination of the pathological processes of the three forms of pneumonia, viz., the croupous, the catarrhal, and interstitial. No! This specific tubercular virus is intimately connected with the inflammatory processes, which acting sometimes as an existing, and sometimes as a predisposing cause, always furnishes the most suitable nidus for its hatching and propagation. Hence, if we would manage consumptives with advantage, we must remember, that while the bacillicide with pure air is our sheet anchor, the treatment of inflammation by counter irritants and occasional antiphlogistics must not be neglected. Its climatic aspect is also important. The latter is specially necessary to be borne in mind in reference to winter mountain climates, for that which is best for the specific affection may be unendurable to its attendant inflammation. Moreover, I do not contend that sulphur is alone capable of rendering inert the bacillus of tuberculosis, for great heat and extreme cold if unattended with moisture, have probably the same effect. Some physicians of eminence are also of opinion that mountain air acts in the same manner owing to its anti-putrefactive properties, which anti-putrefactive property mountain air *per se* does not possess more than the air of the plains, for I have myself seen decomposing meat at a height of 4,500 feet, and have even had occasion to condemn it. Overcrowding, diet, bad drainage and moisture will prove as injurious on the hills as the lowlands. The pure air which M. Pasteur found so deleterious to the life of his microbisms is probably equally beneficial at whatever elevation it is found. Withal, so far as drugs are concerned, the analogy, the teachings of history, even my own experience of the sulphur show that it is not only *primus inter pares*, but without a rival or a peer. There are some anti-contagionists, whose pickets being driven in by the discovery of Koch, yet stoutly maintain

that there is nothing specific in the bacillus of tuberculosis, that it is not essential to the development or spread of consumption, but merely an epi-phenomenon common to certain phases of this, as of other, affections.

This view is clearly untenable, that is, if the description of the cultivation, isolation, and reproduction of the disease from the second and third generation is to be credited. And if, for the sake of argument, we may be inclined, and with justice to criticize strictly the descriptions of the authors of abstruse discoveries, still, I think everybody who believes in the researches of Pasteur with reference to charbon, must, to be rational, also accept the discovery of Koch. A great man of science—Cuvier—once said that on the whole he found it correct to accept rather than cavil at the conclusions of those who had given any subject their undivided attention. But the contagiousness of consumption, no more than the contagiousness of cholera or leprosy, or the exanthemata, does not rest, nor is it dependent on the discovery of any special bacillus. Such a discovery demonstrates and substantiates for the sake of the incredulous what was always the accepted creed in tropical countries where the catarrhal element is not so powerful a factor of complication, and I myself have, from observation, arrived at the same conclusion, and predicted the discovery of a specific germ of a bacterial character long before the profession was made familiar with the bacillus of Koch. The discovery and isolation of which microscopical atom—shorter than the diameter of the red cell—disposes of the objection of Tappinger and Schotellius, as regards the injection of *non-tubercular* matter, and even *cheese* was followed by tuberculosis in rabbits, which I have always explained in two ways, first, as proving too much, and second, by the action of a non-specific irritation, calling into activity this latent disease to which rodents are peculiarly liable.

With these remarks rendered necessary to place the subject in its proper light, and to prevent disappointment to those who might be disposed to expect too much from the treatment I propose, I will now proceed to show how I was led to try the inhalation of sulphurous acid.

In reviewing the regions of immunity from consumption, particularly Iceland, where, in spite of an adverse climate, complete immunity—on undoubted authority—exists not only among the natives, but among the children of foreigners with an inherited taint, I was struck with the geological formation of the country. The island is remarkable for its volcanoes and beds of living sulphur, which are scattered over a great portion of the land, and, unlike the Sicilian sulphur mines, the deposit of past geological ages are on the surface of the earth in a

state of constant sublimation and great purity, the deposit being renewed as soon as removed. It thus mingles with the air, and is in the most favourable state to bring its influence to bear on the virus of tuberculosis.

Iceland may be described as the sole lowland subarctic region of immunity. The torrid regions of immunity being found on the upland or mountain plateau of Central America—regions, according to Humboldt, abounding in volcanoes, many of which, owing to some subterranean connection, are always in a state of eruption, belching forth sulphur and pitchy stone. Again, in the upland of Mexico, the same conditions have existed for centuries, and Prescott tells us that Cortes, having destroyed his ships before advancing into the country, found sulphur to make his powder by sending his soldiers in buckets down the craters of volcanoes. Thus the Arctic lowland and the torrid mountain regions of immunity, so dissimilar in all respects, agree in the one point of sulphurous formation of the soil. Sulphurous acid is also, as all are aware, useful in the treatment of parasitic diseases—either of the animal or vegetable character—and I have used sulphur vapour in cholera with considerable advantage.

For these reasons I have lately tried it in pulmonary consumption, and with advantage, though at first discouraged by reason of its irritative properties and obnoxious odour. Since, however, combining it as follows, these difficulties have passed away. These preparations [the formulæ for which will be found in the “Synopsis” of this volume] may be had from Mr. Bullock, of Hanover Street, and are :—

- 1st. Vapor acid sulph. c. pini.
- 2nd. Vapor acid sulph. c. eucalyptin.
- 3rd. Vapor acid sulph. c. benzoini.

The first contains sulphurous acid dilute, oil of pine, and kaolin; the latter to assist in forming a mixture. The second contains the acid with the oil of the *Eucalyptus globulus*; this latter ingredient answers the purposes of carbolic acid without its disagreeable odour. The third contains sulphurous acid, with benzoic acid or compound tincture of benzoin. These inhalations may be conveniently dropped on a bit of sponge in a wide-mouthed bottle, or used in an inhaler with hot water, or dropped on a little cotton wool in a respirator, or placed in the nostrils. The latter mode will render superfluous the large hideous instruments that cover both nose and mouth.

Other substances may be used in combination, as, for example, iodide of sulphur and permanganate of potash, as well as any sedative that the peculiar symptoms might at any time suggest. The eucalyptus combination I have found especially useful, and, as an example, I may bring forward the case of a

young lady who, last October, was in an advanced stage of hereditary consumption, with hæmoptysis, a cavity, extensive crepitation, and high temperature, who is now well under the influence of the eucalyptus and benzoic combination treatment. This patient, unless for a fortnight, was never out of London. Counter-irritation, with aconite to control acute exacerbation, were occasionally applied. Quinine was also given, but no cod-liver oil.

On a future occasion I hope to return to this subject with the result of the trial of permanganate of potash and iodide of sulphur, together with a more extended experience of the sulphurous acid treatment.—*Medical Press and Circular*, Sept. 27, 1882, p. 257.

32.—ON RESPIRATORS : OUTDOOR AND ANTISEPTIC.

By EDWARD MACKEY, M.D., Brighton.

I believe that more advantage may be gained from the judicious use of outdoor respirators than is commonly recognised ; and, according to my experience, the objection of the public to wearing them has become less, whilst the profession prescribes them less often than formerly. Messrs. Maw and others have recently favoured me with a selection of specimens for the Sanitary Exhibition at Brighton ; and I think it may be useful to name these, with a few brief notes as to some of them.

Metal Respirators.—1. The principal forms made by Jeffries (named “original”) are three : one for the mouth only (the men’s size larger than the women’s ;) a second (Himalene), for the mouth, with a scarf ; and a third, for mouth and nose (ori-nasal). Most of them are made in two “strengths”—i.e., with more or fewer separate wire plates ; and some so that plates can be added or removed according to the weather. Their speciality lies not only in excellence of workmanship, but also in the fact that all the wires are vertical, so that there is less tendency for moisture to accumulate than there is on crossed wires or netting. Mr. Jeffries claims also that the objection commonly made to all respirators—viz., their retaining, for re-inspiration, injurious elements of air already breathed—does not apply to the vertical arrangement ; and that it retains enough moisture and enough warmth for comfort, whilst carbonic acid and other gases pass through. Certainly, when this form is used only for outdoor exercise, it has seemed to me to answer its purpose well. Of two ladies under observation, wearing the single-mouth form, one, with tubercular disease (at present quiescent, but rendering her very sensitive) has gone out here almost daily throughout

the winter without catching cold or complaining of inconvenience ; the other, the subject of chronic pleurisy and bronchial catarrh, with much dyspnoea, has been able to go out in the evening without any of her former inconvenience.

2. A wire respirator by Rooff (named "Eclipse"), light, and well shaped to the mouth ; worn with marked advantage by a man suffering from strumous deposit in one apex, liable to hæmoptysis ; also by a girl with an old cavity in one apex, and liable to bronchial attacks. Both these patients have been constantly in the open air throughout this winter. But respirators are apt to be kept in use too long without cleaning, and patients seem to expect them to last for ever ; and these slighter-made wire ones are not calculated for continuous effective use more than one winter.

3. The same remark applies to the wire-respirators of Maw, Son, and Thompson. These are made in many sizes and qualities—some only of perforated metal, others of wire. There must be a fair demand for these, for all chemists show them ; their price is moderate. My own experience of them is not very large ; but they have seemed of service in a few cases with tendency to relaxed and irritable throat.

Charcoal, Wool, and Cork Respirators.—4. The charcoal respirator of Dr. Stenhouse is still met with, and contains about one-fourth in-layer of charcoal, protected by wire gauze.

5. Messrs. Bourne and Taylor have constructed a cotton-wool ori-nasal respirator, inspired by the sanguine lecture of Professor Tyndall on wool filters. A movable metal plate, perforated, protects the wool. It is presumed useful in infected atmospheres.

5. The "cloud respirator" of Captain Mackenzie Douglas really deserves a favourable mention. It is named, I presume, from a ladies' "cloud" shawl, and is of wool, woven or knitted, smooth inside, and shaped to the lips, rough and woolly outside, and fastening by elastic. The cost is about a shilling. A girl with softening tubercle at one apex has been able to go out most days (at mid-day), with the air-passages protected only by this, and has not suffered. Another girl, liable to much congestive dyspnoea and catarrh, and accustomed to sleep with a "cloud" shawl round her mouth and nose (which relieved her, but often excoriated her neck from retained moisture), has found the greatest comfort from this simple substitute.

7. A cork respirator, of equal cheapness, is on sale, and might answer ; but I have not used it.

Antiseptic Respirators.—With "antiseptic" respirators, we pass from the idea of prevention to that of cure ; and their use marks unquestionably a great step in advance.

8. Dr. William Roberts's form is of blackened metal, perforated with large holes at the front, shaped to the lips, and about three-fourths of an inch in depth, with a hinged lid opening outwards, allowing the introduction of a saturated sponge or wool. With this, and the following form, it is necessary to carefully regulate inspiration through the mouth, and expiration through the nostrils.

9. Dr. Sinclair Coghill's early form is a hollowed oval of plated metal, perforated with small holes, enclosing a movable and shaped plate, also perforated; between these wool is placed. His later form is of somewhat similar shape externally, but has a hinged plate opening outwards, with wool between the two. This is a decided improvement; and, in this form, his respirator is identical with one (10) sent me by Messrs. Aitken of York, on a request for Dr. J. Carrick Murray's.

A patient with chronic cavity, and profuse foetid expectoration, which has not been checked by ordinary remedies or vaporous inhalations, has worn one of the last-mentioned pattern for about an hour night and morning (making use of the compound antiseptic fluid, dispensed according to Dr. Coghill's formula), with marked improvement in the character, and lessened amount of expectoration.

11. Dr. McDowel Cosgrave's "skeleton" (John Whyte, Dublin) is a very light and ingenious form of wire cage, shaped to the mouth, and enclosing between a spring-hinged plate a piece of lint, about one inch from the lips, and just under the nostrils. Of course, the vapour is not so completely charged with the remedy used; but, on the other hand, the apparatus is well borne by children and others, who could scarcely tolerate a heavier one. One phthisical girl, who inhales terebene on the lint, for about an hour morning and evening, has certainly improved, and I believe partly on account of this practice; her temperature is now normal (or subnormal), instead of 101° Fahr., and there is no septicæmia.

12. But, certainly, the most complete and effectual instrument for its purpose, is that of Dr. Hunter Mackenzie (Edinburgh), named though it has been by some of my patients the "portable coal box." It is in metal, and shaped like a chloroform-inhaling mouth and nose piece; it has four rubber valves, two on the sides opening outwards, and two inwards from the antiseptic chamber; this is in front on the truncated nose piece, and an oval perforated rimmed plate fits on it, and can be taken off for the purpose of saturating a contained sponge. The valves enable the patient to breathe without trouble in the ordinary way, and secure the immediate exit of expired air.

Since this was written, Messrs. Meyer and Meltzer have introduced a much lighter and more elegant form of this

respirator, in pink vulcanite ; this leaves nothing to be desired.

Dr. Saundby has recently figured a form which recalls that adopted by Dr. Roberts, but is much more freely perforated ; it is made also with a nose piece. His patients have found it "light, comfortable, well ventilated, and not fatiguing."—*British Medical Journal*, July 1, p. 13.

DISEASES OF THE ORGANS OF DIGESTION.

33.—ON FÆCAL RETENTION, ESPECIALLY AS IT AFFECTS THE CÆCUM.

By JOHN HARLEY, M.D., F.R.C.P., Physician to St. Thomas's Hospital.

There is, of course, no morbid condition more frequently witnessed than constipation. A retention of the contents of the colon for forty-eight hours is sufficient, in some persons, to render the fæces hard and lumpy ; and there are hosts of people who think they pay proper attention to the wants of nature if they unload their bowels once in two or three days. Nor is the number of those who habitually go a week very small. While constipation is the commonest ailment that comes under our notice, how rarely do we seem to trace it to a fatal issue, and to study its effects after death ? "seem," I say, for I am convinced that many a fatal attack of enteric fever has its origin in constipation.

Nor is death from simple idiopathic constipation a very common event. I can myself adduce two instances from my own practice, and show from a number of others how soon matters assume a grave aspect when the bowels are allowed to become slowly impacted with fæces.

In order to trace the effects, both local and constitutional, of constipation, I will briefly give the history of three cases which will serve to illustrate the condition.

Case 1 is that of an elderly lady who had resided for many years in India ; she came under my care during the last thirteen years of her life, and died at the age of seventy-nine of an attack of constipation. Throughout life she was satisfied if her bowels acted twice or thrice a week, but when away from home, or if there was the slightest risk of her privacy being disturbed, she would allow a week or longer to elapse before she got relief of her bowels. She led an active life, walking a good portion of each day, and as often as she felt bilious took a colocynth pill and so got what she regarded as sufficient relief. As she grew older and less capable of exercise, the bilious attacks became more frequent and violent, and then it was that my aid was sought, and I learned from her maid the

real state of affairs, namely, that her mistress usually went to the closet only once a week, that her motions were always scybalous, and that when matters came to a climax and strong purgatives were used, a vast quantity of lumpy fæces were discharged. "Do, sir, get mistress to pay more attention to her bowels, for these attacks make her dreadfully ill; and I am sure she will do herself harm by neglecting herself in the way she does," was an appeal which her intelligent maid made to me more than once. The patient herself, however, thought but lightly of the matter. She as good as told me that once a week was often enough to attend to such a disagreeable duty; and when I suggested the occasional use of an enema, "Don't mention such a thing again," she said, "I would rather die than use it. Give me any medicine excepting castor you like, and I will take it."

Such was my patient. Whenever a repetition of the usual pill failed to remove the obstruction, she was attacked with bilious vomiting, and from the quantity discharged it was evident that the amount of unused bile retained was somewhat commensurate with that of the retained fæces. The vomiting of bile usually continued uncontrolled for twenty-four hours, and was, of course, attended with great prostration. The usual remedies were five to ten grains of calomel with half a grain of opium, and an effervescing draught of citrate of soda and hydrocyanic acid, at intervals. A little iced brandy and water was the only sustenance that could be retained, and this was as often rejected as not. As soon as the bowels were relieved the attack subsided.

The attacks recurred pretty regularly at intervals of three or six months, and on one occasion calomel, and subsequently a large dose of compound colocynth pill, failing to open the bowels, I said, "My only safe resource is the enema." I explained its simple, direct action, and the danger of forcing a passage from above. She shook her head, smiled, and said, "Give me a good dose of croton oil, that I know will be effectual." I was obliged to yield, and fortunately the result was satisfactory.

I now provided the maid with an indiarubber enema apparatus, showed her the use of it, and urged her to get her mistress to use it. But the lady's conservatism and abhorrence of everything that savoured of French customs got the better of her own sound judgment and of our entreaties; and it was only in her last attack, and a few hours before her death, that I disregarded her scruples, and for the first time washed a few large scybala coated with fluffy mucus from the rectum. But this time the vomiting caused rapid prostration, and she was "*in extremis*" and died unrelieved of her constipation about ten hours after the commencement of the attack.

Case 2 will serve to illustrate a passive variety of the same condition. The subject was an old servant of my own, a little spare woman, nearly seventy years of age. I was once asked to see her, and found her in bed, prostrate, with a dry brown tongue and a pulse of 80. She could give me no further account of herself than that she had completely lost her appetite, and was too weak to go about her work. She looked, indeed, as if she were going to have typhus fever, but, the skin was cool and free from rash. On examining the thin abdomen I could distinctly feel nodular fæces, and then I discovered that she was habitually constipated, and that the bowels had not acted for seven or eight days. A clyster of soap and water followed by a dose of castor oil brought away a large quantity of scybalous matter, and she was well again in the course of a few days, but continued weak for several more. During the time she was in my service she had three such attacks, exactly similar, the dry brown tongue being very characteristic. I prescribed an aperient pill, giving her warning not to neglect the action of the bowels, and she has followed my directions and experienced no more attacks. She is still living near the age of eighty.

These two cases illustrate the difference in the symptoms which attend the same condition in different individuals. The one (*Case 1*) was an excitable, highly emotional person; the other was of a placid disposition, and had no tendency to vomiting.

Such an individual it appears was the subject of *Case 3*, who actually died of constipation without any indication of obstruction.

Case 3. — Fatal constipation without prominent symptoms.—Charles C—, æt. 17, was admitted moribund into the London Fever Hospital, 13th November, 1866. No history could be obtained of him, except that he had been very weak and “out of sorts.” His body was spare almost to emaciation, the skin supple, free from rash, and cold, the hands and feet dusky, the eyes sunken, the pulse thready, the tongue moist and dirty; the abdomen was not enlarged, and it had a doughy, inelastic feel. He was free from pain or distress—apathetic, indeed—and took drinks with difficulty. He did not rally, and died next day.

After death.—The small intestine was found void of fæcal matter, the mucous membrane everywhere injected and covered over with a layer of purulent-looking mucus, the surface beneath was red, vascular, bare, and in patches considerably inflamed. The whole of the large intestine, from the opening of the vermiform appendix to within two inches of the anus, was impacted with fæces; in the colon formed into tripartite

masses, each lying in a separate cell, and only attached to the mass above and below at the centre, where it was three-quarters of an inch thick. The colon was contracted on these scybala so as to have a very regular nodular appearance. The cæcum was filled with one large mass of very stiff, dark-greenish fæces, weighing about a pound. On raising the scybala from the mucous surface, this was found to be vascular and covered over with a thick layer of yellow opaque mucus, and at some parts, in the cæcum especially, the mucous membrane was much inflamed. All the other viscera were healthy.

Here is a case in which constipation set in gradually, attained its fullest development, was, as far as could be ascertained, wholly uninterfered with, and was thus allowed to run its fatal course. Let us consider the effects, both local and general, which are consequent upon such a condition.

The earliest effect of constipation is the absorption of moisture, and the conversion of the soft fæces into lumps or nodules. A considerable amount of mucus is secreted and incorporated with the fæces as a normal process, and it would appear that there is no diminution of the amount of mucus thrown out when the fæces are retained, for one of the most obvious effects of constipation is the formation of a thick layer of opaque mucus upon the surface of the scybala, filling up the interstices between the nodules, and when placed in water seen as a thick fluffy coating. Such a layer of mucus no doubt acts as a protective covering, and at the same time, by obstructing osmosis, prevents the absorption of fæcal matter. But retained mucus is itself liable to putrescent change. Ozæna, for example, is commonly produced by the decomposition of retained mucus; it becomes opaque and purulent, and then very soon disorder arises in the germinating layer, the blood-vessels become congested, growth ceases, the mucous membrane softens, and the unhealthy surface easily bleeds and soon presents patches of erosion. If this state of unhealthy congestion of the mucous membrane be not relieved by the expulsion of the unhealthy contents of the bowel, irritation and pain sooner or later ensue, as the immediate forerunners of inflammatory action. It is but reasonable to expect that lymphatic irritation would arise very soon in such a condition as this, and thus the solitary and agminated glands would be involved, when the symptoms would be indistinguishable from those of developed enteric fever. I could adduce several instances of this transition, but I will content myself with the following case, which will be easily recognisable as a link in the chain:

Case 4.—Fæcal accumulation in the cæcum inducing some of the symptoms of enteric fever.—James R——, æt. 40, a large, rather fat man, a policeman, was admitted into the London Fever

Hospital, 8th June, 1871, on the fourteenth day of his illness. He gave the following account of himself:—The day before his illness commenced he accommodated a colleague, who had just left the fever hospital convalescent from an attack of relapsing fever, with a bed, and was disgusted by a bad smell arising from his clothes. Next day, when on duty, he felt an icy chilliness and pain in the legs. On the second day he had pain in the abdomen, and he applied to a medical man who gave him pills “to work it off.” The pills acted, and he continued on duty until the ninth day, and then took to his bed, where he remained until the day (fourteenth of the illness) of his admission. At this time there had been no action of the bowels for ten or eleven days. The mind was clear, tongue moist with an even coating of white fur, the skin coldish and free from rash, pulse 100 and weak. There were pain, tenderness, and fulness in the right iliac fossa; the rest of the abdomen was rather doughy to the feel. There was anorexia, but he took fluids. Hot fomentations were applied and stimulants administered. Excepting a pain in the right gluteal region, extending to the knee, and very free perspiration with beads of sweat on the forehead, he continued in the same state.

On the sixteenth day half an ounce of castor oil was given; it acted once moderately. On the eighteenth day the pulse was 120, the temperature only slightly elevated, the skin free from rash and still perspiring, the tongue still moist with a dirty-white fur. A simple enema produced two loose stools, the first containing scybala. The next day (nineteenth) a defined, hard, tender tumour, in which the patient experienced some throbbing, could be felt in the cæcal region, the fulness and solid feeling passing upwards to the hepatic region. A light loose stool was discharged spontaneously to-day. He was now ordered daily enemata of castor oil and the continued application of linseed and mustard poultices to the right iliac region. The first enema produced a loose yellow stool with a few hard scybala as big as filberts.

On the twentieth day the throbbing had ceased, the abdomen was less full, and now the tumour in the cæcal region was appreciable to the eye, lying in the iliac region; it was firm and not very tender, and reached, on the left side, to within two inches of the mesial line upwards; to the hepatic region, and downwards two inches below the level of the anterior superior spine of the ileum. The breath had a disagreeable sweet odour.

During the next two days there were eight or nine loose stools—a very copious relief. These evacuations consisted of disintegrated fæces, being thin and yellow without scybala.

On the twenty-second day a great diminution of the fæcal tumour was noticed, and manipulation gave very little pain.

On the twenty-third day there was a marked improvement in the general condition, and the tumour was no more perceptible than the sigmoid flexure before a natural evacuation. The tongue was still covered with a thick white fur, the skin was cool and occasionally perspiring very freely; the patient was comfortable but feeling weak.

During the next few days the enemata continued to bring away large quantities of faecal matter, and this part of the treatment was now finally omitted.

On the twenty-eighth and thirtieth days a very copious semi-solid stool was discharged each day, the tongue began to clean, and the appetite to reappear. Fish was allowed, but it appeared to provoke diarrhoea and was discontinued next day. Perspiration was still profuse, the abdomen retracted, and the caecal tumour quite gone. The bowels continued loose for the next seven days, two or three stools in the twenty-four hours, the motions being watery and light yellow.

This outbreak of diarrhoea was preceded by the appearance of a few rose spots upon the trunk on the thirty-second day. At the end of a week the motions acquired a natural consistence, and there was no further development of rash after the thirty-second day. Perspiration still continued profuse at times, and the pulse declined to 84. The patient was very weak, and there was considerable emaciation. It was the forty-seventh day before the appetite returned and he was able to take solid food. He regained his strength slowly, and was discharged on the sixty-fourth day.—*St. Thomas's Hospital Reports*, vol. xi., 1882, p. 129.

DISEASES OF THE URINARY ORGANS.

34.—ON CODEIA IN THE TREATMENT OF DIABETES.

By R. SHINGLETON SMITH, M.B., B.Sc.Lond., M.R.C.P.,
Physician to the Bristol Infirmary.

The nervous system having been shown to be the agent by which diabetes could be most readily induced, physicians had not long to observe before they found that nature's experiments gave exactly the same results as those on the medulla of the lower animals; and cases of glycosuria associated with disease in the cervical region of the spinal cord are now known to be far from uncommon.

Glycosuria having been shown to depend primarily on disease of the nerve-centres, it is not a little interesting to observe that the drug which most controls it is one which affects nerve-tissues more especially. Opium has, indeed, been used empirically in the treatment of diabetes ever since the time of Aetius.

Lecorché observes that since the time of Willis opium has become, so to speak, the panacea of diabetes.

Dr. Lauder Brunton says that under the influence of opium the thirst diminishes, the excretion of urine becomes correspondingly less, and the proportion of sugar present in it falls. He might have added that the weight of the patient ceases to diminish, and generally improves. Recent observers have not been content to rest with this knowledge, but have endeavoured to ascertain to which of the alkaloids contained in opium the beneficial effect is due. Morphia has been found to act in a way similar to that of opium; and there appears to be little or no difference of opinion that the one drug, morphia, is equally useful as the other, the watery extract or some other preparation of opium. Codeia was first recommended by Pavy, and was preferred by him, inasmuch as it might be given in large doses without producing drowsiness.

The narcotic action of codeia has been established by various observations on the lower animals; the minor poisonous effects, as noted in human beings, are semi-coma instead of sleep, nausea, vomiting, severe pain in the stomach, sometimes tinnitus aurium, slight salivation, feeling of pressure in the temples, weakness of sight, and a somewhat remarkable retardation of the pulse (Phillips's *Materia Medica*). The potency of codeia as a soporific would appear to have been much exaggerated; the highest dose employed by Krebel was about one grain, and he recommended only one-fifteenth or one-sixteenth of a grain for sensitive subjects. Of late, it has been much employed, as recommended by Dr. Saundby, in the treatment of the cough of phthisis, where one grain dissolved in a drachm of syrup gives very great relief to the cough, and has also an appreciable soporific effect. But it is more particularly in the treatment of diabetes that codeia has proved to be of the greatest service.

This question of dose is an important one, and is at the root of the use of codeia in diabetes. Some authors recommend small doses; but Dr. Brunton states that "diabetics bear large and sometimes enormous doses of opium and codeia; and, in administering these remedies, it is well to push the dose until the sugar either disappears from the urine, or until increasing drowsiness obliges us to discontinue it." Dr. Brunton (*Practitioner*, vol. xii) says: "The two remedies which are most serviceable in lessening the excitability of the nervous centres in diabetes are opium and its alkaloid, codeia. The latter may be given in doses of a quarter to half a grain three times a day at first."

Dr. Pavy (*Guy's Hospital Reports*, vol. xv) gives a remarkable series of cases, in which daily records of the composition of

the urine were made, and in which careful analysis of the urine showed that the sugar disappeared entirely under the influence of opium, morphia, or codeia, with the aid of restriction in diet. The drugs were given in gradually increasing doses: opium in doses of one grain up to nine grains thrice daily, morphia up to three grains, and codeia up to ten grains three times a day. The great advantage of codeia over opium and morphia was found to be that, whilst equally efficacious in controlling the disease, it does not exert the same narcotic effect. When given in a small dose to begin with, and increased gradually, nothing may be perceived beyond its effect upon the disease.

Dr. Cavafy, in the St. George's Hospital Reports, has subsequently reported a case in which he gave fifteen grains thrice daily with a good result.

Dr. Ord has also reported the case of a woman aged 33, with diabetes of four months' standing, who gained seven pounds in one week with one grain of sulphate of codeia twice a day, after diet alone had failed to produce any good effect.

It is remarkable that so experienced a physician as Trousseau should not allude to the use of opium and its alkaloids in the treatment of diabetes. He says that alkalies are unquestionably beneficial; and that other medicines, tonic remedies, such as rhubarb, may be associated with them; and yet he does not mention the fact that opium has ever been given, and he does not discuss its utility. (Clinical Medicine, vol. iv.)

It is equally remarkable that Dr. Heineman of New York, in the American edition of Zeimssen's Cyclopædia, omits all mention of codeia and of opium in diabetes. He gives details as regards dietary, and states that preparations of ammonia are destined to take an important rank in the treatment of this disease.

On the other hand, Budde states that his observations show that alkalies have no special influence in diminishing the excretion of sugar.

Dr. Kratschmer gives results of a series of observations with a view of testing the value of carbonate and sulphate of soda, and of morphia, upon the excretion of sugar. He finds that neither the carbonate nor the sulphate appeared to exert any influence on the amount of sugar excreted, but he has satisfied himself that in morphia we possess an agent that is not only capable of materially reducing the excretion of sugar, but also of diminishing to a remarkable extent the general tissue-metamorphosis of the body (Practitioner, vol. xii).

Carbolic acid and the salicylates have also been much lauded, as also more recently boracic acid. Numerous observations have shown no good result from these drugs; and I submit that time should not be wasted in therapeutical experiments on

patients, and that such drugs should only be given when codeia has been found to be either useless or injurious.

Although I cannot claim such satisfactory results as those given by Dr. Pavy, yet the cases to be reported show that the drug employed has a remarkable power of checking the elimination of sugar, and that a corresponding improvement in the health of the patient results. It would appear that alkalies, and all other methods of treatment, are far inferior to the treatment by codeia, which may be considered to have almost a specific action on the disease. The facts before us seem to justify decided language with regard to the use of codeia, which should not be permissive, but imperative, in all cases of advanced diabetes mellitus: whatever else may be given, codeia should first be given, and in fairly large doses, until some physiological effect is produced. Even dieting appears to sink into insignificance by the side of codeia; in one case given by Dr. Pavy, the codeia alone was sufficient, without any restriction of diet, the patient being on a mixed diet the whole time.

It has been supposed that codeia is a dangerous drug. Barnay (London Medical Record, October, 1877) says: "The tendency of codeine to produce convulsions is so great, that it should be excluded from therapeutics." It has been stated, as a result of Bernard's experiments on the opium-alkaloids, that whilst narceine is the most soporific element, codeine is that which most tends to convulsions. The literature of codeia does not bear out this statement, and I have never observed anything to support it.

I have now endeavoured to show that the utility of codeia is by no means universally recognised, but that it is fully deserving of confidence—nay, more, is imperatively demanded—in the treatment of diabetes where treatment other than dietetic is required.—*British Medical Journal*, June 24, 1882, p. 933.

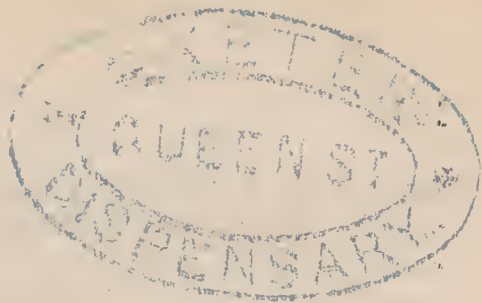
35.—ON A NEW TEST FOR ALBUMEN IN URINE.

By WILLIAM ROBERTS, M.D., F.R.S., Physician to the Manchester Royal Infirmary.

When an albuminous urine is treated with a saturated solution of common salt, not the slightest reaction takes place; but if the brine be slightly acidulated with hydrochloric acid, the albumen is thrown down as a dense white cloud. This reaction constitutes a most delicate test for albumen in the urine. The best degree of acidulation for this purpose is obtained with about 5 per cent. of the dilute hydrochloric acid of the Pharmacopœia. A little more or a little less acid makes no appreciable difference in the sensitiveness of the test. Common salt dissolves in about two and a half times its weight of water at 60° F., and increase of temperature does not sensibly increase

its solubility. The salt of commerce is always more or less dirty, and the solution requires filtration to fit it for use as a test. The salt solution should be fully saturated, otherwise the observer is apt to be led into error. In preparing the test with our common English measures the readiest plan is to mix a fluid ounce of dilute hydrochloric acid with a pint of water, and to saturate this with common salt, and filter. Dilute hydrochloric acid may be replaced by dilute sulphuric, dilute nitric, or dilute phosphoric acid. All these acids are of the same saturating strength in the British Pharmacopœia, and all of them yield with saturated salt solution an equally sensitive reagent for albumen. Even acetic acid may be used, but the delicacy of the test in that case is not quite so great as when it is prepared with one of the mineral acids. The method of applying the brine test is similar to that followed with nitric acid. A portion of the suspected urine is placed in a test-tube, the test-tube is then held very much aslant, and the salt solution is allowed to trickle along the sides of the tube to the bottom, so that it may form a distinct layer below the urine. If albumen be present, a white cloudy zone appears at the junction of the two fluids. Or the proceeding may be reversed. The salt solution may be first introduced into the test-tube, and then the urine added with the same precautions as before, so as to obtain two distinct layers, one above the other, in the test-tube. It is important to be aware that the precipitation of albumen by acidulated brine is not due to a true coagulation. In this respect the brine test differs from nitric acid and boiling. In the two latter cases the albumen is transformed into the insoluble modification, which is known as "coagulated albumen." But when albumen is thrown down from urine by acidulated brine, the precipitate is not insoluble; on the contrary, it is redissolved by free addition of water, or even by free addition of the albuminous urine itself. It is therefore essential to the efficient application of the test that the salt solution should be in excess at the point of expected reaction. This end is obviously secured in the above-described methods of testing. It may also be secured by adding to the suspected urine a volume of the salt solution at least equal to that of the urine in the test-tube. If this point be not attended to the test is unreliable. For instance, if acidulated brine be added drop by drop to an albuminous urine, and the mixture shaken up after each addition, the first few drops either occasion no turbidity whatsoever or the turbidity produced disappears on shaking. But when by successive additions the quantity of brine approaches to or surpasses the volume of urine operated on the turbidity remains permanent. In point of delicacy the salt test stands on a par with nitric acid. The minutest trace of albumen detectable in the urine by nitric acid is also detectable with

equal ease by acidulated brine. In high-coloured urines the brine test is distinctly superior. In this class of urines nitric acid produces a deepening of the tint, with, often, a disengagement of gas, which interferes with the sensitiveness of the reaction, but the brine test neither alters the tint nor causes disengagement of gas. On the other hand, I think that nitric acid gives a better idea of the quantity of albumen present by the density of the white cloud produced than does the brine test. In addition to albumen, acidulated brine precipitates peptones, which are sometimes present in urine; so that occasionally a slight cloudiness is produced by the salt solution where nitric acid and boiling (which do not precipitate peptones) produce no reaction. This distinction in the action of the brine test may hereafter lead to interesting information. In dense urines, highly charged with urates (but not containing albumen), the addition of nitric acid sometimes throws down the amorphous urates in the form of thick white clouds, and it is necessary to apply heat to distinguish with certainty the cloudiness so produced from cloudiness due to albumen. The salt test does not throw down the urates in this way. It is well known that the urines of patients who are taking large doses of resinous substances (such as the resin of copaiba), although free from albumen, yield a cloudiness with nitric acid in the cold, but if the urine be previously made hot, nitric acid produces no such reaction. This difference serves to distinguish cloudiness due to resin from cloudiness due to albumen. The brine test also produces a cloudiness in resinous urines, and the reaction occurs whether the urine be hot or cold. To avoid the fallacy thereby arising, all that is necessary is to add an excess of the urine which is being tested. If the cloudiness be due to albumen it disappears on such addition, but if it be due to resin, the cloudiness does not disappear on the addition of more urine. One of the chief advantages of the salt test is its incorrosive character. It does not stain nor burn holes in garments and carpets, nor fleck the hands with yellow spots. The use of it makes it possible to arrange a pocket-case for urine testing that shall not be a terror to the wearer. From this point of view the substitution of the salt solution for nitric acid will be a real boon to practitioners. The salt test has this additional convenience—that it enables us to test successively for albumen and sugar on one and the same sample of urine. The suspected urine is first tested for albumen with the salt solution, and then Fehling's solution, or, still better, a pellet of the solid Fehling's test sent out by Cooper is added, and heat applied. After boiling a few seconds the absence or presence of sugar is ascertained. The admixture of the brine in no way interferes with the copper reaction, in case sugar should exist in the urine.—*Lancet*, Oct. 14, 1882, p. 613.



SURGERY.

FRACTURES, DISLOCATIONS, AMPUTATIONS, AND DISEASES
OF BONES, JOINTS, ETC.

36.—ON THE “COAT-SLEEVE” METHOD OF PERFORMING THE CIRCULAR AMPUTATION.

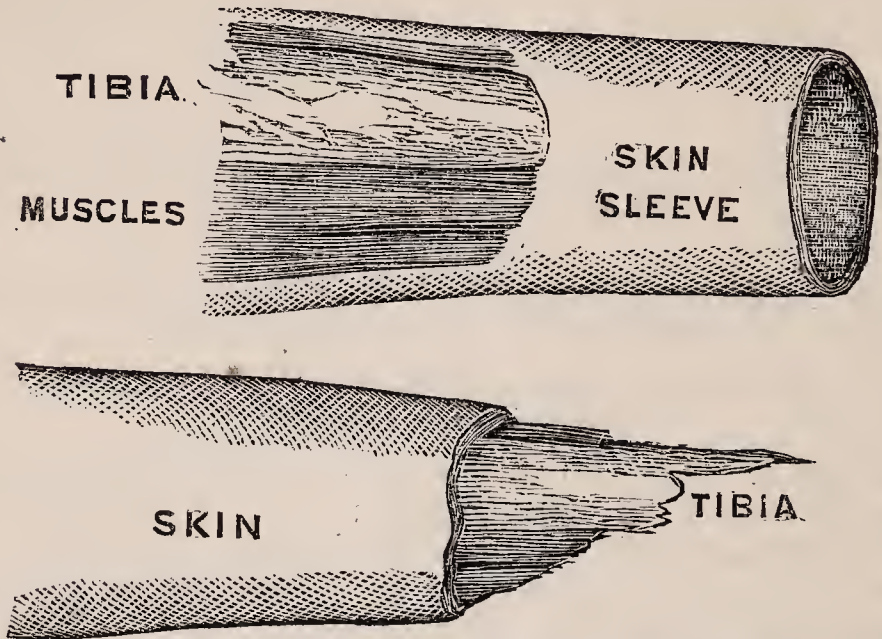
By RICHARD DAVY, Esq., M.B., F.R.C.S., Surgeon to the
Westminster Hospital.

In practice, there are accidents and diseases which yet call for the necessity of amputations; and I wish to notice a method of performing these operations which I have already carried out on three occasions—viz., one amputation of the thigh and two of the leg. For brevity's sake I will style this method *the coat-sleeve*; and this name has been chosen because my left coat-sleeve has illustrated this procedure to my class, and gives a good idea of the operation. Cheselden (1720), of the Westminster Hospital, originally advocated the circular plan of amputation, which, according to Syme, was modified by Mr. Mynors of Birmingham; and this circular method has held its ground as a standard procedure; but I think good reason may be given for advocating still further modifications in this amputation.

Let me first describe the details of this *coat-sleeve* operation, and next point out the advantages that result from it.

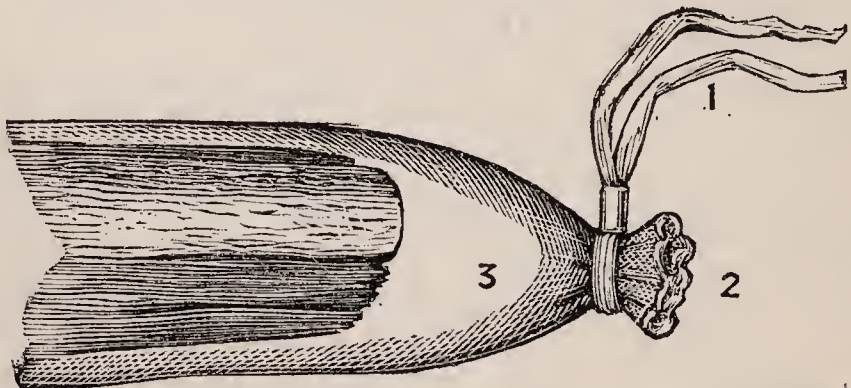
Carry in your minds the essentials of a circular amputation (a very good account of this circular method is given in William Hey's *Surgery*, 1814, page 526); and you will see that the coat-sleeve method is but a modification of a very old operation. Let me insist on the formation of a long integumentary sleeve, from three or four to six inches; and that your dissection should be directed so as to separate the superficial from the deep fascia; and very much of this dissection is accomplished by firm traction of the skin towards the trunk of the patient, assisted by slight drawings of the knife on attachments. I have frequently, on the dead body, invaginated skin on skin, as the cut end of the finger of a glove may be turned over the kid on the finger; and on the living patient this is necessary, so as to gain sufficient length of skin-cylinder from its end to the point at which division of the bone takes place. Compare these diagrams, illustrating, to my mind, the perfection and imper-

fection of a properly planned amputation: the upper one of which shows the coat-sleeve method; the lower, a conical stump.



I would impress on you not only the importance of making a far greater allowance for retraction of skin in planning an amputation, but also the comparative uselessness of any other structure than skin for making an efficient and lasting pad for the end of the bone. It is the skin, fat, and hypertrophied sub-structure that give a good cushion; and with stumps, as well as ordinary seats, when once the leather has given way, the so-called stuffing soon wears, and bare boards and bare bone shortly show themselves. The tuber ischii, knee, elbow, and heel are good illustrations of these points.

Having dissected your skin-sleeve accurately, and divided all the structures down to the periosteum, carefully peel this membrane upwards to the point at which the saw is to be



applied, and shelter the soft structures from the stroke of the saw by means of a slit bandage; retracted by an assistant; and, within reasonable limits, the smaller the saw is, the easier

is the division of bone effected. Next, trim your stump (*i.e.*, cut off with scissors any projecting tendon or nerve), and tie or twist the bleeding vessels. Then tie up the skin-sleeve (3) with a piece of tape (1) passed through a cylinder, as shown in the diagram; allowing the ligatures (if any) to hang through the crucial slit at the face of the stump. Treat your wound either with or without dressings—I much prefer none; and carefully watch that no undue strangulation of the “off-end” (2) of the skin-sleeve occurs. Should the stump become cedematous, or any necessity for drainage arise, insert a drainage-tube into the centre of the face of the stump, of sufficient firmness to prevent a too ready collapse of its walls (*e.g.*, a piece of gum-elastic catheter), and allow the excretion to flow into a pledget of marine tow or some absorbent material. As yet, I have not had occasion to resort to any artificial drainage. The wound cicatrises up to one-half or one-fourth of an inch; and a central button of depressed scar-tissue results, surrounded by soft, fatty skin-cushions, plaited in a radiating manner from the centre to the circumference of the face of the stump. This method of amputation is applicable to any part of the extremities, in those cases where the surgeon has the opportunity of selecting the precise point of removal, and where the adjoining skin is sound. In my own experience, the middle of the leg, where the muscles of the calf swell, is about as difficult a situation as any for carrying out the dissection of a long sleeve.

Case 1.—J. C., aged 6, was admitted on many occasions into Mark Ward, suffering from recurrent acute attacks of synovitis of the right knee-joint. He was admitted on the last occasion on December 2nd, 1880. On March 8th, 1881, finding the boy was steadily becoming worse, and sinuses multiplying, I amputated his right thigh (junction of middle and lower third) by the plan now under discussion. His convalescence was excellent. The stump was good; a circular small cicatrix formed in the centre of its face; and linear creases of skin and fat radiated from the centre to the circumference, suggesting the button sewn into an ordinary sofa-cushion. He has been rustivating for the last few months at Hurst near Twyford, or he would have been shown to-day.

Case 2.—T. D., aged 13, was admitted into Mark Ward on June 1st, 1881, for strumous disease of the left ankle-joint and periostitis of the lower end of the tibia, with much skin-ulceration. He was operated upon on August 16th, 1881, by the coat-sleeve method (middle of leg); was discharged on Sept. 28th, 1881; and has walked well with a bucket-leg since.

Case 3.—J. S., aged 42, was admitted into Henry Hoare Ward in August, 1880, drunk, and with a compound commi-

nated fracture of the right tibia and fibula, which resulted, after six months' treatment, in an ununited fracture. Many fragments of bone were removed on and subsequently to his admission. On October 8th, 1881, he was re-admitted; and on October 11th, 1881, the coat-sleeve method of amputating was resorted to, through the ununited fracture. He was discharged well on January 13th, 1882; and has been walking about with an artificial foot until within the last ten days, when he fell and broke his opposite femur (left). He promised, otherwise, to have shown himself to-day. The instruments used at this amputation were few—Esmarch's bandage, scalpel, artery and torsion forceps. His stump (when I last saw it, in March 1882) was the perfection of what a stump should be: central depressed cicatrix, and good fatty skin-creases around, making, by involution of the scar, a soft circular cushion, on which his weight (and he is a very heavy man) was carried painlessly.

Lastly, let me point out what are the probable advantages of this method of amputating.

1. The conservation of an abundance of skin, subcutaneous fat, and areolar tissue, which, by mechanical arrangements, are utilised, so that the scar is reduced to a minimum, and the cushions to a maximum.

2. The total abolition of sutures, which, however necessary, are invariably painful on removal; and the sutures, as previously employed, necessitated a linear cicatrix on the face of the stump.

3. The facility granted to the house-surgeon for restraining, and to the patient for escaping, secondary hemorrhage.

4. Freedom from pain, exclusion of air, and adaptability for perfect drainage.

5. The symmetrical appearance and utility of the stump.—*British Medical Journal*, June 17, 1882, p. 900.

37.—ON A NEW METHOD OF REDUCING DISLOCATIONS OF THE HUMERUS.

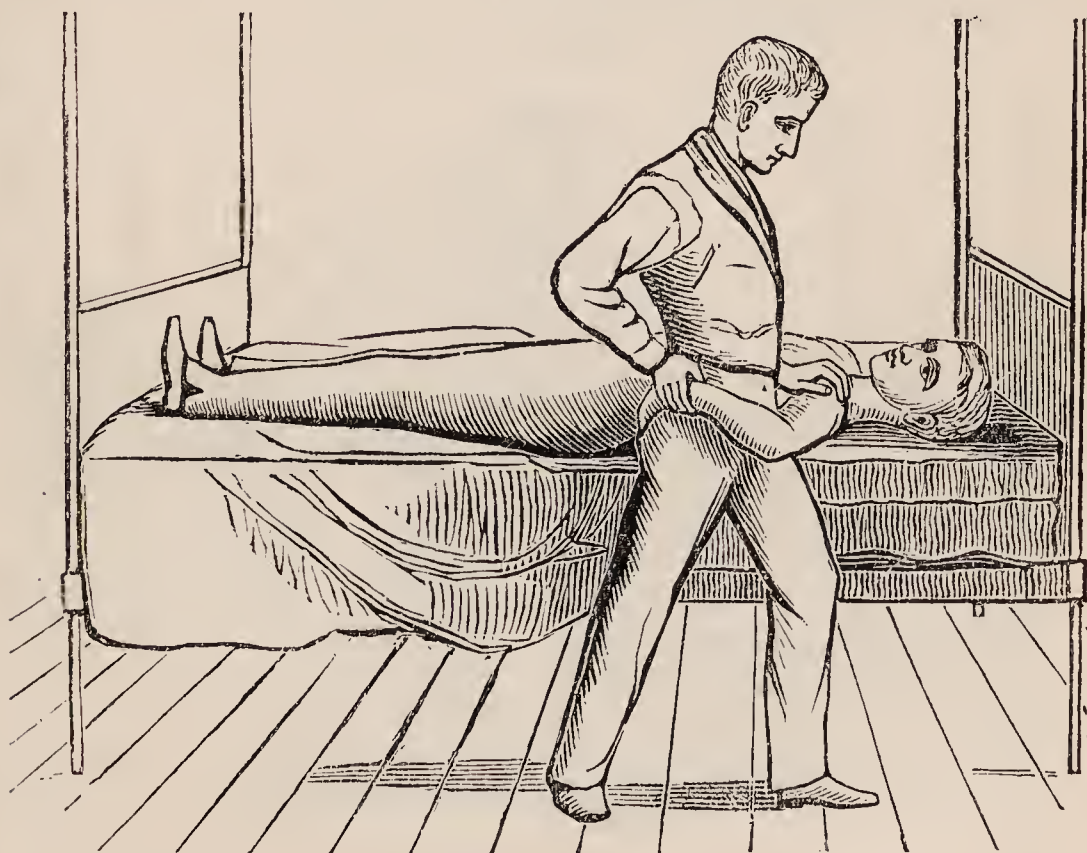
By JAMES E. KELLY, Esq., F.R.C.S.I., Surgeon to
Jervis Street Hospital, Dublin.

I shall confine my remarks to luxations of the humerus, and I shall briefly narrate the circumstances under which I was fortunate enough to discover my method of reduction. Late one night, a sailor, aged forty years, was admitted into Jervis Street Hospital with intracoracoid dislocation. He was a man of remarkable muscular development, and of a highly nervous temperament. After trying unsuccessfully some of the ordinary modes of reduction, I thought of controlling his vigorous and powerful resistance by the administration of chloroform, but

upon examining his heart, I discovered such extensive valvular disease that I hesitated to produce anæsthesia without formal consultation, which was impracticable at such an hour. As the patient suffered great pain, and was clamorous for speedy relief, I repeated my efforts, and exhausted every means of reduction with which I was conversant; until in a mental condition, intermediate between desperation and a vague sense of the utility of the measure, I turned my back towards the patient, who was on a mattress, and, lying across him, I drew his arm round my pelvis, and giving my body a sudden turn, or version, I was delighted by the agreeable sound and sensation which indicate the reduction of a dislocation.

The striking success of this expedient, after the failure of so many time-honoured and valuable modes of reduction, produced in my mind a train of thought which resulted in the elaboration of the method which I recommend, with a confidence based upon the extensive experience of over twenty successful cases, with but one failure.

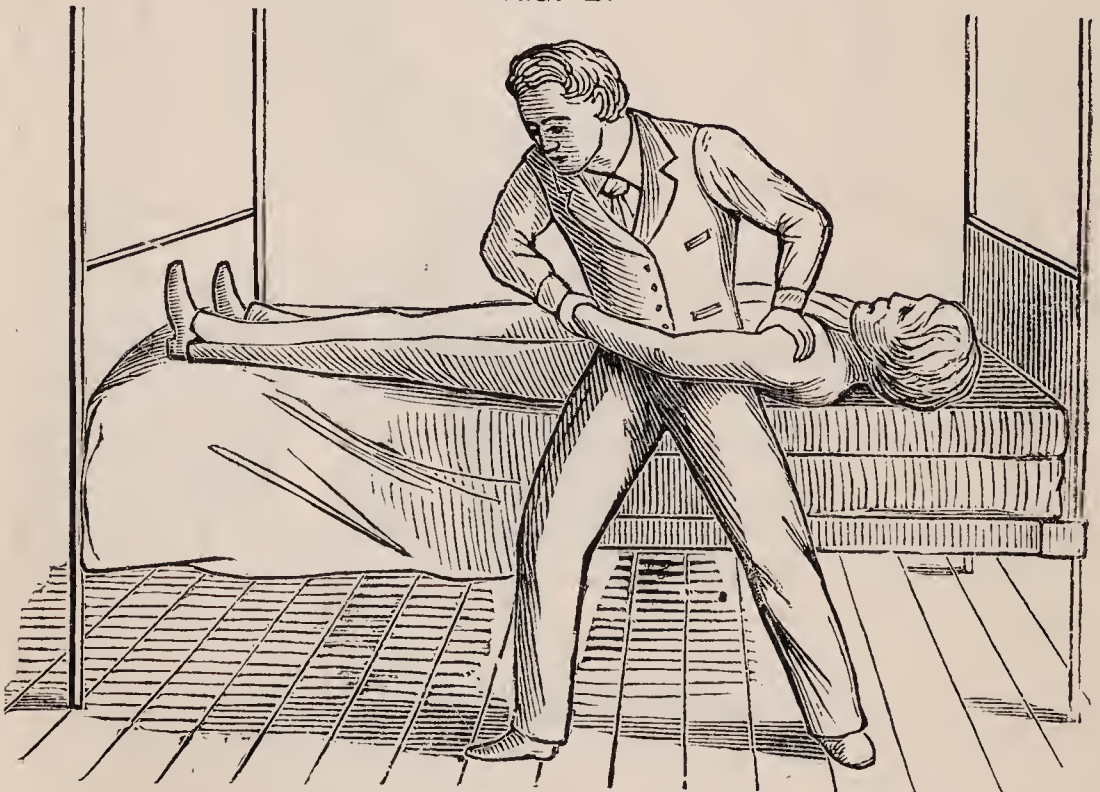
FIG. 1.



For my operation, the selection of a couch or bed is of importance. It should be firmly fixed, and hard, and, when a choice is practicable, I prefer it, for the subglenoid dislocation, to be about three inches lower than the great trochanter of the operator, whilst one lower still by a few inches, for the anterior

dislocations, and a little higher for the posterior, allows the force to be applied advantageously in the direction of the glenoid cavity. The patient should be placed as close as possible to the edge of the couch, on his back, with his head low. In order to make the description of the procedure intelligible, I shall divide the operation into two stages. The first, or preparatory stage, in which the surgeon assumes the most favourable position for the reduction, is well depicted in Fig. 1. The operator places the injured arm at right angles to the body, and standing against it, with his side to the patient and his hip pressed firmly, but not roughly, into the axilla, he folds the arm and hand of the patient closely round his pelvis, and fixes the hand firmly by pressing it against the crest of his ilium. The second stage, during which the reduction is effected, is very simple, consisting merely of a rotation, or version, of the surgeon's body into the position represented in Fig. 2, with a force and rapidity which necessarily vary with the peculiarity of the dislocation—some yielding most readily to a sudden and powerful effort, and others to gentle and gradually increasing traction.

FIG. 2.



(In both the woodcuts the operator's right hand should be represented as being more posterior, and grasping the hand of the patient rather than the wrist.)

In reviewing this manœuvre I shall briefly contrast the substitutes which it affords with the recognised methods of making

extension, counter-extension and coaptation. In the application of extension, instead of the grasp of the operator, which is often insufficient, the clove-hitch or other knot, the special bracelets, combined with flexion of the fore-arm, bandages, chamois or adhesive plaister, I propose the simple folding of the arm, forearm and hand round the pelvis, which, forming a series of angles, distribute the resistance, so as to enable the operator, with one hand, to afford sufficient fixity for the application of the powerful extending force. For the limited strength of the operator, the uncertain and mutually obstructive force derived from numerous assistants, or the dangerous and sometimes disastrous mechanical extension by pulleys or adjusters, I would substitute a perfectly controllable and easily sustained power of some hundreds of pounds, derived from nearly all the muscles of the trunk and of the upper and the lower extremities. Again, for counter-extension, which must have been a matter of great difficulty, when such means were necessary, as the split-sheet, the fixation-table, the albi, or the special belts, the numerous assistants, the suspension of the patient over a door, through a ladder, or from the ceiling, I suggest the weight of the patient's body and the resistance afforded by its traction or friction over the rough surface of the couch. For coaptation, in lieu of the various fulcra, such as the heel, the knee, the bed-post, as well as the special balls, the jack-towels, &c., I supply one which is safe and efficient—safe, inasmuch as the well-padded gluteal region is unlikely to produce such injuries as laceration of the axillary vessels or fracture of the ribs; and efficient because, in the torsion of the body, the hip materially assists by forcing the head of the humerus towards the glenoid cavity, and by its volume it makes the extension tend to the desirable angle of 45° , which places the deltoid and supra-spinous muscles in the most favourable condition. For any additional "manipulation," the surgeon has the hand next the patient's axilla disengaged for such manœuvres as lifting the head of the humerus into its cavity, making traction upon it forwards or pressure backwards, according to the nature of the dislocation. The fixation of the scapula, a point of considerable importance, is secured by its position between the couch and the body of the patient, while its inferior angle is supported by the gluteal region of the operator.

One of the great advantages of this operation is the ease with which a surgeon can reduce almost any dislocation without assistance or the appearance of violent exertion; but should a case of peculiar difficulty present itself, additional extension may be applied by one or more assistants making mediate or immediate traction on the patient's arm; and the counter-extension is as

readily increased by pressure on his uninjured shoulder or his pelvis.

The importance of being able to dispense with anæsthesia in operations is indisputable, especially when the surgeon is summoned to perform them suddenly, and without assistance, as so frequently occurs in dislocations. I claim this advantage to a very great extent for my method, as in only one case in my experience have I had to resort to that or any other auxiliary.

My colleagues, Messrs. William Stoker and Cranny, have informed me of seven dislocations occurring in their practice, and reduced by my method.—*Dublin Journal of Medical Science*, Sept. 1, 1882, p. 185.

38.—ON TWO NEW METHODS OF REDUCTION IN DISLOCATIONS OF THE FEMUR.

By JAMES E. KELLY, Esq., F.R.C.S.I., M.R.I.A., Dublin.

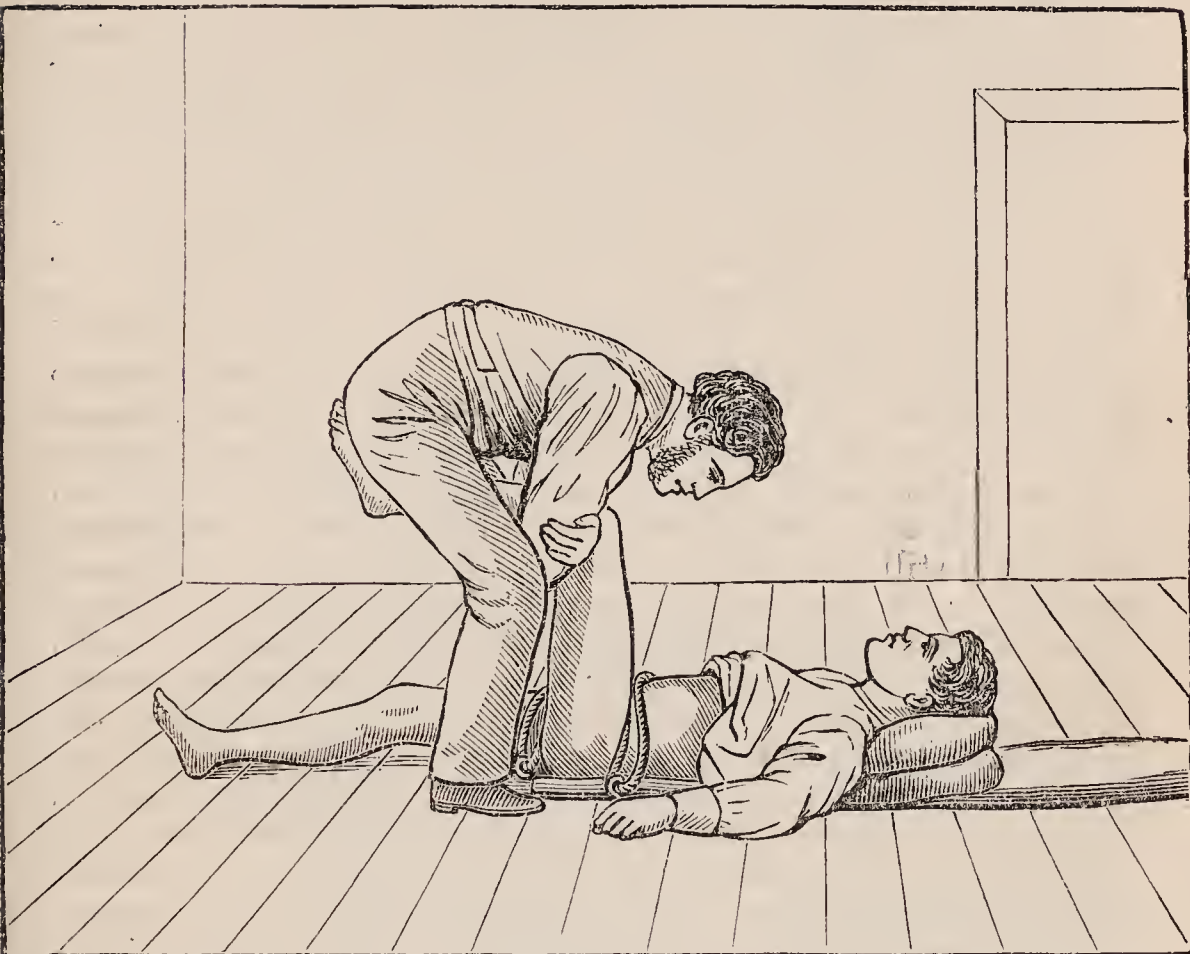
I propose to introduce to the notice of the profession two new methods of dealing with dislocations of the femur, which, for convenience of description, I shall divide into anterior and posterior.

The following were the circumstances under which I had the good fortune to devise my method of treating posterior dislocations:—Several years ago a patient, aged about forty or fifty, suffering from a dislocation on the dorsum ilii, was admitted, during the service of one of my colleagues, into Jervis Street Hospital. He was a remarkable man, having gained by his prowess the title of “King of the Quay Porters,” a body distinguished for their strength and endurance. My colleague, a gentleman of the highest attainments, on three occasions consulted with the staff of the hospital, and with other eminent surgeons, including the late Mr. Adams. Guided by his personal knowledge and the suggestions of his friends, he caused special apparatus to be constructed, from which he expected increased facilities, and ineffectually tried every recognised method of reduction. At the last consultation I obtained permission to test an expedient which had occurred to me. I fixed the patient’s pelvis firmly to the floor, and standing over the limb, I flexed it, and placed his foot between my thighs; then passing my forearms under his knee, I made vigorous traction upwards, when, to our great relief, I effected the reduction.

By this favourable result and a successful experience of more than six other cases, in some of which many methods were tried, I have been enabled to develop the details of the procedure which I shall now describe. Three strong “screw hooks” are inserted into the floor close to the perinæum and each ilium of

the patient, and to those hooks he is secured by a strong bandage or rope. The injured thigh is flexed at right angles to the patient's body; the foot and lower extremity of the tibia are placed against the perinæum of the surgeon, who, bending forward with his knees slightly flexed, passes his forearms behind the patient's knee, and grasps his own elbows. He is

FIG. 1.



now in the best position (Fig. 1.) to accomplish the reduction. With this object he exerts his strength to draw the femur upwards, which action is generally sufficient to effect it; but, when necessary, circumduction may be combined with extension, as the surgeon, while maintaining traction sways his body towards the patient's uninjured side, then towards his head, then outwards, and stepping backwards, he lays with a sweep the injured limb by its fellow, and thus the dislocation is reduced. In ischiatic dislocations a bandage, upon which an assistant may make traction, can be passed round the thigh close to the trochanter, and may be useful for the purpose of liberating the head of the bone from the sacro-sciatic foramen.

While analysing this measure, I shall contrast the facilities

afforded by it and by the other methods of reduction for making extension, counter-extension, and coaptation. In femoral dislocations the application of extension is more difficult than in humeral luxations, owing to the dimensions of the limb, which render the grasp of the surgeon almost useless; while the clove hitch and other appliances are notably insecure when placed above the knee, over which they slip with great facility. When the traction is applied to the ankle much of the power is lost, owing to the length of the intervening limb, and the great advantage derivable from the application of the leg as a lever to rotate the femur is forfeited. In my method the extension is applied in the most approved direction, and with the greatest economy of force, as the muscles of prehension are hardly called into play, being only required for the slight effort necessary to fix the hands on the elbows, while the forearms are flexed by their numerous and powerful muscles, and the patient's leg is kept in position by being a lever of the third order, and its displacement, owing to the unfavourable point to which the power is applied, would require a force of over a thousand pounds. Extension, when derived from many assistants, as I observed in my paper on Dislocations of the Humerus, is awkward and obstructive; and when it has a mechanical source it is still less desirable, being rigid, unmanageable, and dangerous; it can only be applied slowly, and in a fixed direction; when in action its effect cannot be estimated until, perhaps, much mischief is done; and when the surgeon wishes to know if his effort be successful he can only ascertain this by relaxing the tension, which can but be effected, slowly, by reversing the pulley, or, in a violent and tumultuous manner, by the interposition of some of the ingenious and well-intended instruments constructed for the purpose. The agency which I would substitute is ample, under perfect control, and sustainable, if necessary, for a considerable time, being derived from the most powerful muscles of the body—namely, those of the back, the shoulders, and the lower extremities. It is an adaptation of the feat termed by athletes “raising” or “lifting a weight,” which affords the most powerful example of human dynamics—reaching in some instances, to 800 or 1,000 lbs., the average being from 300 to 500 lbs.—a force which, if mechanical, the careful surgeon would rarely exceed. Again, as the grasp of the gymnast is one of the limitations of the exploit, my method, which minimises this function, economises a certain amount of muscular energy, which possibly may be utilised in increasing the lifting power of the operator. The counter extension is simply only limited by the strength of the floor, the hooks, and the bandages or rope. The boards are secured from being displaced by the fact that in addition to his own weight

the operator transmits to them a resistance equal to the power he exerts. The thread upon the screws should be deep, that they may not be easily torn through the boards, and they should be inserted at an angle obtuse to the body of the patient, as thus they afford the greatest resistance. The coaptation which I propose is a combination of the principle of vertical traction, accidentally discovered by Dr. Allen, of Vermont, while lifting a patient into bed, and termed "automatic reduction," and of the "manual method" of Hippocrates and Paulus Ægineta, which has been formulated in Europe by Desprès and Pouteau in the words "flex, abduct, and rotate"—the greatest prominence being given by them to "abduction," while Reid and Bigelow in America use the terms "flex, abduct, and evert"—

FIG. 2.



Bigelow regarding "flexion" as the most important motion. "Reduction by manipulation," which includes all those refinements, must be adapted to the multiformity of dislocations, and due prominence given to that element or constituent of the manœuvre which is best adapted to the characteristics of the case. Another factor in coaptation is the rotatory force

exerted on the femur by the lateral motions of the leg, acting as a lever, commanded at its upper extremity by the arms and at the lower by the thighs of the surgeon. This is a power capable of great utilisation.

For anterior luxations I propose the following method, which is a modification of that suggested for humeral luxations:—The patient is placed on his back on a bed or table of such an elevation that his pelvis is nearly as high as the trochanter of the surgeon. A bandage passed round the pelvis, and secured on the side of table or bed furthest from the dislocation, affords efficient counter-extension. The surgeon, with his face directed towards the dislocated joint, stands on the inner side of the injured limb, with his trochanter pressed firmly against the femur; bending the leg behind his back he grasps the ankle with the corresponding hand, and is in the position (Fig. 2) to effect the reduction. He now rotates or turns his body away from the patient, thus making traction on the femur in the most favourable direction, and, at the same time, pressing its head towards the acetabulum. I have already considered the mechanism of this expedient in my former paper. The operator has one hand disengaged for the application of minor manipulation if it should be necessary.

Before concluding this article I wish most distinctly to disclaim any intention of proposing a substitute for that great triumph of modern surgery, the treatment of femoral dislocation by simple manipulation during anæsthesia; but most surgeons of experience have encountered instances of its failure, even in the most skilful hands. In such cases I claim many advantages for my methods, which afford other avenues of escape from that true opprobrium of surgery, an unreduced dislocation. They also promise to render the surgeon independent of anæsthesia, assistants, and mechanical power, as in several of my cases I have reduced the dislocations without aid from any source.—*Dublin Journal of Medical Science*, Oct. 1882, p. 265.

39.—HEY'S INTERNAL DERANGEMENT OF THE KNEE-JOINT.

By J. F. KNOTT, Esq., L.K.Q.C.P.I., Senior Demonstrator of Anatomy, Royal College of Surgeons, Ireland.

In the volume of "Practical Observations in Surgery," published by Mr. Hey, of Leeds, is included a paper "On Internal Derangement of the Knee-joint," which contains the original description of the very peculiar lesion to which the name of this distinguished surgeon has since been attached. It is given in the following words:—"This joint is not unfrequently affected with an internal derangement of its component parts,"

and that sometimes in consequence of *trifling* accidents. The disease is, indeed, now and then removed, as suddenly as it is produced, by the natural motions of the joint without surgical assistance; but it may remain for weeks or months, and will then become a serious misfortune, as it causes a considerable degree of lameness. . . This disorder may happen with or without contusion. In the former the symptoms are equivocal till the effects of the contusion are removed. When no contusion has happened, or the effects of it are removed, the joint, with respect to its shape, appears to be uninjured. If there is any difference from its usual appearance, it is that the ligament of the patella appears more relaxed than in the sound limb. The leg is readily bent or extended by the hands of the surgeon, and without pain to the patient—at most, the degree of uneasiness caused by this flexion or extension is trifling. But the patient himself cannot freely bend, nor perfectly extend, the limb in walking; he is compelled to walk with an invariable and small degree of flexion. Though the patient is obliged to keep the leg thus stiff in walking, yet in sitting down the affected joint will move like the other.

“The complaint which I have described may be brought on, I apprehend, by any such alteration in the state of the joint as will prevent the condyles of the os femoris from moving truly in the hollow formed by the semilunar cartilages and articular depressions of the tibia. An unequal tension of the lateral or cross ligaments of the joint, or some slight derangement of the semilunar cartilages may probably be sufficient to bring on the complaint. When the disorder is the effect of contusion, it is most likely that the lateral ligament on one side of the joint may be rendered somewhat more rigid than usual, and hereby prevent that equable motion of the condyles of the os femoris which is necessary for walking with firmness.”

Such are the words of the earliest notice of this peculiar injury which we possess, and such is the uncertainty as to the accurate diagnosis in which the original describer has left his readers, and, so far as we can see, was obliged to remain himself. Sir Benjamin Brodie notices Hey's observations, and says that “the symptoms very much resemble those produced by a loose cartilage within the joint,” but his views of the actual nature of the lesion seem even more indefinite than those of the latter writer, and he states further on, in reference to a case which occurred in his own practice, that “the facts which I am about to state are not very easy to be reconciled, either with this hypothesis or with that suggested by Mr. Hey.” Many, at least, of the surgeons of the present day appear to have made up their minds to a very decided view of the state of things in Hey's internal derangement of the knee-joint; and,

without much more conclusive evidence to go upon than that which was possessed by the distinguished surgeons whose names I have mentioned, unhesitatingly inform their readers or hearers, as the case may be, that the symptoms are due to a luxation of one of the semilunar fibro-cartilages, which are interposed between the cartilaginous surfaces in the femoro-tibial articulation. To examine the validity of the grounds for such a conclusion is my chief object in making this communication. To do so satisfactorily, it will be necessary to call attention to some of the more prominent features in the mechanism of the knee-joint, and to notice the connexion of the fibro-cartilages, which concern us so intimately in this lesion.

The upper end of the tibia presents an extensive surface, bearing two articular facets separated by a rough non-cartilaginous surface, which runs in an anterior-posterior direction, and is chiefly destined for ligamentous attachment. Of these facets the internal is the larger, and of somewhat oval shape, with the long axis passing from before backwards; it is also somewhat more hollow than the other, although the amount of depression on either side is but slight, and is still further diminished by the greater thickness of the articular cartilage in the central part. The outer facet approaches the circular form.

The inferior extremity of the femur is more extensive than the opposed articular surface of the tibia on which it rests. The deep intercondyloid notch separates the two condyles, of which the latter is prolonged downwards considerably further than the external—a disposition which determines the internal obliquity of the shaft of the femur, and the formation of an angle salient inwards on the inner aspect of the knee-joint.

It is obvious that the very shallow depressions on the upper end of the tibia can afford no security for the condyles of the femur during the various movements of the joint. The glenoid cavities for the reception of these articular prominences are, accordingly, almost solely formed by the semilunar cartilages. Each of the latter structures presents three surfaces—a superior, which is markedly concave; an inferior, nearly flat; and an external, forming the prominent rim, which is connected to the fibrous structures surrounding the joint. This rim is about five centimetres in depth; at the inside the cartilage thins down to an irregularly festooned edge. On examination of the mutual relation of these cartilages we find that the external forms almost a complete circle, while the internal forms a C-shaped curve, elongated from before backwards, and of which the extremities embrace those of the outer cartilage. These extremities (*cornua*) are extremely strong, and bind the

cartilages with great firmness to the non-articular portions of the osseous surface, while the circumferential aspects of the cartilages are bound to the margin of the head of the tibia by the so-called coronary ligaments. The other surfaces are covered with synovial membrane, and glide smoothly—the upper on the cartilaginous surface of the corresponding femoral condyle, the lower on the head of the tibia. “The fore part of each is less fixed than the hinder, so that it may be free to follow up the condyles as the latter recedes from the front of the tibia in flexion, and be pressed back again into its place in extension” (Humphry). In the case of the external cartilage the posterior cornu has an accessory attachment to the femur, which accompanies the posterior crucial ligament (*cornu postiei adhesio prima* of Weitbrecht, *ligamentum cruciatum tertium* of Robert). This femoral adhesion causes the cartilage to follow, in a limited degree, the movements of the lower end of the thigh bone; and its nearly circular outline, with the greater looseness of its coronary attachments, and the fact that it does not, like the internal semilunar cartilage, adhere intimately to the corresponding lateral ligament of the joint—all combine to secure to the external cartilage a greater degree of mobility than is permitted to the internal.

The more obvious movements of the knee-joint are those of flexion and extension, characteristic of the ginglymus articulation, of which it forms an imperfect type. In addition to these, the knee possesses, when moderately flexed, a rotatory movement, which, as shown by the brothers Weber, may attain a range of 39 degrees. The vertical axis around which these movements take place passes through the head of the tibia at the *inner* side of the spine. The use of the greater mobility of the outer cartilage is obvious in this action, for if it were absolutely fixed to the head of the tibia, any considerable rotatory movement of the latter bone would throw the external femoral condyle out of its articular cavity.

Slight lateral movements of the *passive* variety may also be demonstrated in the knee-joint when the leg is semi-flexed. In this position, the ligaments being relaxed, external pressure will produce movement of the tibia to either side; the latter bone gliding, to a very limited extent, of course, upon the articular facets of the femoral condyles.

With regard to the more ordinary movements of the knee, an interesting anatomical fact has been demonstrated by Tillaux. This anatomist has pointed out that a vertical antero-posterior section through one of the condyles is not limited at the lower end by an arc of a circle, as formerly represented; the cartilaginous surface represents two arcs—one anterior, and the other posterior, belonging to circles of different radii, and separated

by a portion of a very flattened ellipse. The mechanical result of this arrangement is that in flexion of the knee there is, at first, rotation around an anterior axis; towards the middle of the movement, a combination of rotation and gliding, which is, in turn, replaced by a purely rotatory movement towards the end of the act of flexion. The axis, around which the movements of flexion and extension take place, passes through the femoral condyles at the level of the attachment of the lateral ligaments of the joint.

A careful examination of the various observations of "internal derangement of the knee-joint" that have been placed on record will show that writers on the subject have included, under the same denomination, two distinct varieties of surgical lesion—one, in which the displacement affected the semilunar cartilages only; the other, in which, besides the derangement of the cartilages, there is also a change in the normal relations of the femur and tibia, or, in other words, an incomplete dislocation of the leg.

Some cases of the former class were unaccompanied by any prominences or displacement visible externally, as occurred in some of the instances observed by Hey himself. A good example of "internal derangement" has also been recorded by Bonnet (de Lyon):—"A very active man, aged forty-five years, twisted his knee in making a movement of external rotation. I saw him two days after the accident; no physical derangement could be detected in the knee; there was merely a small amount of serous effusion into the synovial cavity. The patient could walk only with extreme pain, he suffered much, and could extend the leg upon the thigh but in a very incomplete manner. This disproportion between the impairment of motion, which was carried to an extreme degree, and the inflammation, which was but slight, made me think that a luxation of the semilunar cartilages had probably taken place. I then flexed the knee as much as possible; this flexion was painful. Having done this a first time, I extended the leg, and flexed again. This manœuvre was followed by immediate relief; the patient was able to walk with less pain, and to extend the leg upon the thigh completely. The inflammation rapidly subsided."

Very valuable evidence with regard to the nature and mechanism of the injury was obtained by this writer from the results of experiments performed on the dead body. In the body of an adult male who had succumbed to a chronic malady, and whose articulations in consequence presented a considerable degree of relaxation, Bonnet found that by flexing the leg to form a right angle with the thigh, as the body lay in the prone position, and suddenly rotating the foot outwards, a peculiar

snap was felt, after which the limb remained in the position of external rotation, with the leg flexed upon the thigh at an angle of about 45° . At the antero-internal aspect of the knee-joint a prominence could be felt corresponding to the inner tuberosity of the tibia; this prominence projected in front of the inner condyle of the femur; the head of the femur was carried backwards and inwards. The rotation of the leg, measured by the deviation of the foot, amounted to nearly a quarter of a circle. Upon extending the leg (for which a slight effort was found necessary) the snapping sensation was again felt, and the normal relations of the articular surfaces were re-established. Subsequent dissection of the knee showed no displacement of the interarticular structures, and no appreciable laceration of either ligaments or muscles. In the next experiment he removed the patella, and, repeating the movements already described, he watched the effect on the interarticular structures. The snapping sensation was then found to be produced by the passage of the inner condyle of the femur behind the semilunar cartilage, which was, accordingly, pushed forwards on the internal glenoid cavity of the tibia, but without any laceration of the internal lateral or capsular ligament of the joint. On the outer side the condyle had undergone no considerable displacement; it was carried a little forwards from its normal position, but still lay in the glenoid cavity formed by the external semilunar cartilage. On extension of the limb, with a little effort, this peculiar luxation was at once reduced. The experiment was frequently repeated with a similar result.

Cases have been observed in the living body corresponding closely with the facts observed by Bonnet on the cadaver. But these cannot properly be regarded as luxations of the semilunar cartilage; they are incomplete rotatory dislocations of the leg itself. The possibility of the existence of a lesion of this kind cannot well be doubted, and the author of the present communication can add to the evidence already published on this subject a description of the accident as it has repeatedly occurred in his own person.

With regard to the other form of displacement, in which the semilunar cartilage alone is said to alter its position without the application of extreme violence, or the coexistence of extensive laceration of the other fibrous structures which enter into the formation of the joint—I look upon its occurrence in the normal anatomical state of the parts as a physical impossibility. Any anatomist who has taken the trouble to test the strength of the cornua which fix the cartilages to the head of the tibia, not to mention the accessory fastenings afforded by the coronary, jugal, and tertiary crucial bands, and the adhesions

to the capsular and internal lateral ligaments, will have, I think, but small faith in the existence of a displacement engaging the semilunar cartilages only, and produced by a slight amount of external violence.

In many of these cases the history corresponds more or less closely to the following type:—A slight amount of violence is applied to the foot on its inner side, when the knee-joint is flexed to a very slight degree; the ligaments about the knee in the somewhat relaxed condition which corresponds to this posture; and the muscles, as it were, thrown off their guard. A sudden acute pain is then felt in the joint at the inner side, and the patient is unable to move the leg, which remains fixed in a slightly flexed position, with a certain amount of abduction and external rotation. Sir Astley Cooper, whose description of the etiology of this lesion agrees more closely with my experience than that of any other writer whom I have consulted on the subject, has observed it to occur most frequently when a person in walking strikes his toe, the foot being at the same time *everted*, against any projecting body, such as the fold of a carpet. He also met with the accident in a person who had suddenly turned in bed, when, the clothes not suffering the foot to turn with the body, the thigh-bone was believed to slip from the articular cavities formed by the semilunar fibro-cartilages.

Before summarising my conclusions as to the state of things in the more typical forms of Hey's internal derangement of the knee-joint, I will relate the causes, symptoms, and treatment of the lesion as it has repeatedly occurred in my own person. It has always been the result of *very slight* and, in every instance, *indirect* violence. The violence has always been applied so as to produce a twist of the knee either of the leg outwards or femur inwards. The more common cause was striking the inside of the great toe against something when the knee was slightly flexed, and the parts about the joint as relaxed as possible—when, if I may be allowed to use the expression, the muscles were thrown off their guard. It has never occurred to me when the limb was in a decided state of active movement. It first occurred to me (when a boy) as I was sauntering slowly along a pasture-field in the country. I lightly struck the inner side of the point of my shoe against some elevation in the ground, and was instantly brought to a stand-still by pain of an agonising character developed in the interior of the right knee-joint and on the inner side. Besides the pain, I experienced the mingled sensations of fright and helplessness (as I was alone) to a degree which I have never forgotten. I soon reached the ground, by a movement combined of those of sitting and falling. The joint was slightly flexed,

the leg slightly rotated outwards, and all power of voluntary movement of the limb below the knee entirely lost. As this occurred many years before the commencement of my anatomical and surgical experiences, I made no observations on the position of the bony prominences about the knee-joint. But I applied my hands to either side of the knee, and instinctively made as powerful pressure as I could, with the hope of diminishing the pain. The continuance of the pressure caused the flexion of the joint to diminish, when suddenly I felt an exacerbation of the pain following by a loudly audible clucking sensation, conveyed both to hand and ear. This sound was followed by instantaneous and complete relief. No sequelæ followed. But the lesion frequently reappeared, from similar causes, and always yielded to the same treatment. It has also occurred when, in moving the right foot under a table, the inner side of the great toe has struck lightly against one of the legs. As in the other cases referred to, this has only occurred when the knee was already slightly flexed, and the surrounding structures much relaxed. The total number of my personal experiences of this lesion would amount, I believe, to at least a couple of dozen. Several of these occurred while I was a medical student. I have met with the accident twice since I became possessed of a surgical diploma. I early took an opportunity of informing myself of the probable nature of the "internal derangement" of the knee-joint, and was able on several occasions to examine my own joint with sufficient care while still *deranged*. Careful manipulation has convinced me that the internal semilunar cartilage has never, in my own case, been displaced from its tibial attachments. Two very slight prominences could be detected in every instance in which I made a careful examination—an internal, apparently formed by the projecting lower margin of the inner condyle of the femur; and an antero-external, found on the inner side of the ligamentum patellæ, and due, I believe, to a projection formed by the upper end of the tibia, and the semilunar cartilage still attached thereto.

Accordingly, my explanation of the nature of this lesion, which I look upon as a typical one of Hey's internal derangement of the knee-joint, is that by the combined twisting and lateral movement conveyed to the knee, at a moment when the ligaments are as lax as possible, the margin of the condyle is *jerked over* the edge of the internal semilunar fibro-cartilage. The immediate result is pressure of this structure, which is increased when the resulting pain brings about spasmodic contraction of the surrounding muscles. The leg undergoes in these injuries a rotatory movement which carries the tibia forwards and outwards. A similar rotation of the leg in the

opposite direction, and an analogous displacement of the outer condyle occurs, I have no doubt, in case of the rarer variety of "derangement" which is located in the outer part of the joint. The comparative infrequency of this latter is, I think, satisfactorily explained by the greater mobility of the outer cartilage, and the existence of a strong femoral attachment, which secures its adaptation to the varying positions of the outer condyle.

Such I believe to be the only form of displacement which can occur from slight or indirect violence in the otherwise anatomically normal knee-joint. The lesions which occur in pathological conditions I have not examined, as I do not think they should be included in this inquiry.—*Dublin Journal of Medical Science*, June, 1882, p. 479.

40.—ON DISPLACEMENT OF THE SEMILUNAR FIBRO-CARTILAGES OF THE KNEE-JOINT.

By E. NOBLE SMITH, Esq., Surgeon to the Orthopædic Department of the Farringdon Dispensary.

[Mr. Noble Smith, in the London Medical Record for August, referring to the preceding article says, Mr. Knott is doubtless correct in his view, that his own accident consisted in 'a combined twisting and lateral movement, conveyed to the knee at a moment when the ligaments are as lax as possible'; the margin of the condyle being jerked over the edge of the internal semilunar fibro-cartilage. But I doubt the view that such a case is typical of Hey's internal derangement of the knee-joint. The cases recorded by Lannelongue and Le Fort, cited by Mr. Knott, seem to have been distinct cases of displacement of one of the semilunar fibro-cartilages; and the cases recorded by us are also probably instances of similar injuries. Mr. Knott believes that the form of displacement from which he himself suffers is the only form which can occur from slight or indirect violence in the otherwise anatomically normal knee-joint. My experience of these cases is in accordance with the opinion expressed by Mr. Hey in his original observations; for in all the cases which I have observed the symptoms appear to indicate a displacement of one of the cartilages forward. I consider that in all these cases an unnatural laxity or weakness of the ligaments of the joint predispose to the accident.]

The peculiar accident which sometimes happens to the knee-joint, and which has been attributed to displacement of one of the semilunar fibro-cartilages, or to some other derangement of the internal structures of the joint, presents many of the characters of a sprain, and is often treated for that affection. The treatment for sprain, however, will not cure these cases,

and if the surgeon is tardy in forming a correct diagnosis, the difficulties of dealing with the case may become increased.

Mr. Hey, of Leeds, described this accident as "an internal derangement of the knee-joint." He recorded several cases and described accurately the manner in which he had cured them. His treatment consisted in extending the leg quietly as much as possible, and then suddenly flexing it while the patient sat in a high chair before him.

Although Hey's description of the above treatment is quite plainly stated in his work, yet, when referred to by more modern surgical writers the method of manipulation is usually wrongly described.

Sir Astley Cooper does not describe Mr. Hey's mode of reduction correctly when he states that it is "by bending the limb back as far as is possible, which enables the cartilage to slip into its natural situation; the pressure of the thigh-bone is removed in the bent position, and the leg being brought forwards, it can then be completely extended, because the condyles of the os femoris are again received on the semilunar cartilages."

Syme, who recorded some cases, states that he adopted Mr. Hey's practice, and after flexing the leg upon the thigh, brought it forwards suddenly, whereas Mr. Hey states that he *extended* the leg quietly and then "suddenly moved the leg *backwards*, that it might make as acute an angle with the thigh as possible."

Sir Benjamin Brodie refers to these cases as described by Mr. Hey. He writes: "By making more complete flexion, and then sudden extension, &c., the mobility of the joint is restored."

I have many times found the treatment as employed by the above surgeons successful, but it is not that which Mr. Hey employed, and I refer to the matter because some cases have occurred in which the derangement could not be relieved, and it is possible that if Mr. Hey's procedure had been adopted, the result might have been more satisfactory.

The administration of an anæsthetic might facilitate reduction in difficult cases, although I have never had occasion to resort to such assistance.

The following is a record of one of the more remarkable of the cases which I have treated during the last few years.

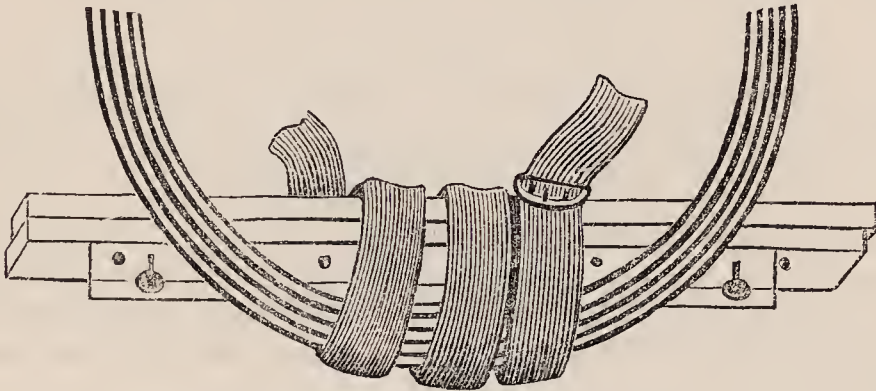
Case 1.—In January, 1880, Mrs. C. M——, æt. 58, stated that she had suffered for many years from "rheumatic pains" in her joints. There was considerable laxity of many of her joints. Upon descending a flight of stairs the heel of the left foot became fixed upon an edge of the carpet which suddenly arrested the forward movement of the leg. Severe pain was immediately felt at the knee, and was referred chiefly to

the posterior border of the joint, just internal to the tendon of the biceps femoris muscle; the pain also extended to the muscles of the calf, and followed the course of the peroneal nerve. The patient had to be assisted down stairs, and the pain recurred upon every attempt to move the leg, especially when ascending and descending stairs. I found the limb could be completely flexed and extended by passive movement, thus differing from the usual condition of such cases in which one or other of these actions is restricted. Rest, fomentations, and liniments were employed for a week, but no improvement took place. Taking into consideration the nature of the symptoms, coupled with the lax and rheumatic condition of the patient's joints, I presumed that some "internal derangement" of the joint had occurred, and that probably the internal semilunar cartilage had slipped slightly forwards and inwards. Acting upon this supposition, I applied pressure with my thumb upon, and just above the edge of the internal condyle of the tibia, and at the same time firmly and quietly flexed and extended the leg upon the thigh with my other hand. Relief was afforded immediately, and the patient was able to walk quite soundly, but the joint felt weak. A few hours afterwards the accident occurred again, and I endeavoured to restore the parts by flexion and extension without the thumb pressure, but in vain. A repetition of the former mode of procedure immediately set the joint right, and the patient could again walk without any pain. Slight swelling, painful upon pressure, occurred the next day at the spot upon which I had pressed, and continued more or less for a few weeks. During the few weeks the derangement occurred many times, always presenting the same symptoms, viz., great pain upon the outer and posterior part of the joint, extending down the calf of the leg. Flexion and extension *without the thumb pressure* (which I tried upon several occasions) always failed to relieve the symptoms, but a gentle pressure applied chiefly during rapid extension caused a sensation to the thumb and to the patient of something slipping backwards, and relief followed immediately. Stimulating liniments, warm fomentations at night, and cold douche in the morning were used for many weeks. The joint gradually gained strength and the accidents became less frequent and less severe. Four months after the first injury my notes report: If the patient turns suddenly, or slips, a slight return of the displacement takes place, which she relieves by standing upon the sound limb and swinging the other in a lax condition. Jan. 1881: A year after the first injury I find that the displacement has only occurred once during the last six months. May, 1881: No recurrence of the displacement has taken place.—*Medical Press and Circular*, April 26, 1882, p. 351.

41.—NEW CRADLE, SPECIALLY ADAPTED TO FIX EITHER TO A BACK-SPLINT OR TO THE LIMB, AS REQUIRED.

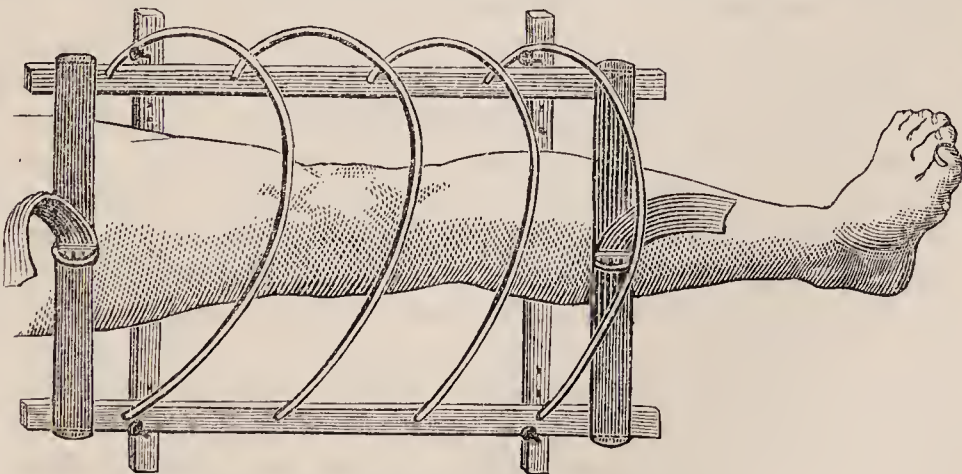
By WILLIAM THOMAS JACKMAN, Esq., M.R.C.S., &c.,
Coggeshall, Essex.

These small cradles will be found of great service to surgeons where it is desired to keep the bedclothes raised from an inflamed joint, either to avoid pressure or to increase the efficacy of evaporating lotions, by allowing above the limb a space into which evaporation can take place. They can be fixed securely to a back-splint, or to the limb if no splint is being used, by means of a broad strap of webbing; the space between



The cradle packed for carrying.

the limb and the hoops of the cradle can be regulated as required. The cradles for the knee and ankle are made of wood, and consist of four movable cane hoops three inches and a half apart, capable of being fixed at any desired height over



The cradle for the knee, adjusted.

the limb into side bars of wood sixteen inches long. The cradle is further secured by means of two sliding laths which pass under the limb and are fixed by pegs; these being adjusted,

assist in the regulation of the height of the hoops. The whole apparatus is very portable, light, cleanly, and of easy adjustment. The length of the cradle is such that only the inflamed joint is protected from the clothes, thus avoiding discomfort to the patient, which the large cradles resting on the bed, as at present used, necessarily cause. The cradles, being really one with the splint or limb, can be conveniently used in cases where the limb is slung. The small space the cradle takes up in the bed is a great convenience. For the elbow joint light angular cradles of stout iron-wire are more suitable; these are fixed to the splint or limb in the same manner as the wooden cradles. Messrs. Ferguson and Co., of Smithfield, are the makers.—*Lancet*, October 7, 1882, p. 569.

42.—ON THE USE OF LAMINATED PLASTER SPLINTS.

By FURNEAUX JORDAN, Esq., F.R.C.S., Surgeon to the Queen's Hospital, &c., Birmingham.

We have in the wards, and always have had during the last few years, several cases showing the use of a simple splint—a splint so simple, that I think we may not inaptly call it the universal splint. I will tell you in a few words what it is, and go more into details afterwards.

Take a few sheets of muslin, put them one over another, spread plaster-of-Paris between them, roll or fold up this “layered” sheet in any convenient form, dip it in water a few moments, lift it out of the water and very gently squeeze it, spread it out neatly and smoothly, and you have a soft sheet of splintage ready for any purpose which splints can secure. This sheet may be little or big; it may envelope a finger or a limb, or the trunk, or the trunk and the head, or the trunk and the lower limb. It is simply drawn under the part, and folded over it. The drawing under, the folding over, and the trimming by means of scissors, are the work of a time measured by seconds. The part is kept in one unaltered position by intelligent force until the sheet sets—a time measured by minutes. A firm, durable, and perfectly fitting splint is thus obtained, which may be left on for weeks or months.

Here is a woman who came in with a tucked knee, the result of joint-disease of some standing. The knee was flexed at a right angle, and the head of the tibia was slightly displaced backwards. Under ether, and by a contrivance to which I shall refer again, we straightened the knee. A prepared laminated plaster splint, having been dipped in water and unfolded, was drawn under the limb, folded over it, and allowed to set before the extending forces were relaxed. In another ward,

we shall see a fractured femur treated by a similar method; the pelvis, thigh, and upper part of the leg being enveloped in a layered plaster splint. All our broken thigh-bones are treated in this way, with this signal advantage—we get them up on crutches in a fortnight. Our broken tibiæ we get up in a few days. Some of you have recently seen a case of osteitis of the wrist enveloped in a laminated splint, a hole in which let the thumb pass through.

This layered plaster splint is, in principle, the exact opposite of the plaster roller. For the lower limb, especially for the lower limb and pelvis, the unrolling of plaster bandages is a slow and tedious proceeding, and necessitates many movements and many positions.

The principle of lamination or stratification in the construction of plastic splintage may, with suitable change of detail, be extended to other materials; but I have hitherto found the checked muslin and thinly spread plaster in superimposed layers the most generally useful—useful in fractures, joint-diseases, spinal diseases; useful, in short, wherever rest, immobility, and support are needed.

The laminated plaster splint is quickly and easily made. The surgeon first determines how much of the limb or trunk it is well to cover. A pattern is then cut. One of the layers of checked muslin does very well for this purpose, as it is stiff enough to keep its shape, and is easily marked with a pencil. Afterwards, other pieces of muslin are cut of the same size and shape. Six or seven layers make a good average splint; three or four will do for a child; eight or nine may be needed for a heavy, restless, or delirious patient. The first layer is laid flat on the table, and sprinkled with a stratum of good dry powdered plaster, which is smoothed over with a spatula or paper-knife; on this, with its margins corresponding, is placed the next layer of muslin, which in its turn is sprinkled with plaster. The process is repeated until all the layers are in place. The splint is then slowly and carefully folded or rolled up and kept dry, ready to be dipped in water when wanted. The water—let this be well understood—immediately passes through any number of layers of muslin and plaster, thoroughly drenching them both in less than sixty seconds.

The part to be encased is drawn into position, and held so until the plaster partially sets. If the fingers of the extending hand be in the way, as when the foot is included in the splint, a temporary sling of webbing or plaster over the instep and heel may be used, which can be drawn out or relaxed afterwards. A flannel bandage, or layer of wadding or jersey, is next applied without traction. The splint is now dipped in hot water (hot for comfort and for more rapid setting) for a minute or so.

When taken out, it is very gently squeezed, being still quite sloppy and limp. When the water is pressed out too freely, the sheet will be sandy, friable, and difficult to apply. The splint is then unfolded, and drawn out in a perfectly soft and smooth sheet; it is next put under the ailing part, and simply folded over. The overlapping margins instantly and firmly adhere to each other. Traction should be most carefully avoided; perfect neatness is enough. The layered plaster splint is applied with as much ease, as regards limpness and adjustability, as is a fomentation; but it is a fomentation which sets, and, with rock-like firmness, lastingly holds the part in any given position.

In the upper limb, the laminated sheet should be large enough to overlap two or three inches; in the lower limb, the overlapping should extend to three or four inches; in the trunk, to five or six. A pair of strong sharp scissors easily trims the splint while it is still wet. Redundance may be now curtailed, or windows made. To get a neat fit opposite joints, especially flexed joints, as the elbow and ankle, the margins of the splint may be notched at each side, or V-shaped bits may be cut out. The corners of a paper box suggest methods of dealing with the elbow. Windows may also be made, and redundancies curtailed very readily, by means of a sharp scalpel, when the plaster is partially set. When the splint is quite dry, a Hey's saw may be used. When it is wished that a sixth or fourth of a whole limb shall be visible, a longitudinal strip is easily removed with a knife in the early setting stage—a stage which lasts long enough for any desired degree of carving. Windows, scollops, or openings of any kind, do not weaken a splint; and it is better to make them opposite bony prominences, breasts, and other compressed parts, as well as opposite abscesses, wounds, and compound fractures. If it be desired, a sheet-splint may be put on at first, so as to leave a longitudinal strip uncovered. If so, a separate outer layer of muslin must be large enough to overlap, and be fixed with a row of pins for a few minutes. I have adopted this method several times; but I much prefer the overlapping method for ease of application and for efficiency. If, in rare cases, an exposed strip be desired, the carving method in the setting stage is preferable. In the upper limb, a gaping longitudinal splint may be conveniently held in place by a few turns of bandage until the setting is firm.

It is convenient, in making a very large splint, to envelop, say, the trunk, or the pelvis and the lower limb; to put it on in two or three pieces made to overlap each other. Where the layered pieces overlap, they amalgamate and form a perfectly homogeneous and continuous splint.

I will now describe the method of putting on the laminated splint in a few of its more simple but most useful applications. I begin with a simple method of applying a plaster jacket. It may be put on under the tripod—an advantage when the tripod is needed. I usually adopt the horizontal posture, as advocated by Dr. Walker. Three layered pieces, averaging about thirty-six inches by seven or eight inches, are prepared. These three rolls are easily packed, and may be carried any distance. If any suspicion of dampness exist, hold them over a fire a few minutes in a frying-pan lined with a newspaper. Marks having been previously made on the mattress opposite the axilla and the trochanter, the pieces, when taken out of water, are so arranged that the patient, sitting in readiness, lies down upon them. The middle piece is neatly and leisurely folded over the trunk (encased in a jersey) first; next, the upper and lower pieces are folded over, their margins freely overlapping the central piece. The upper and lower pieces are so applied as to make a waist—the overlapping ends of the upper piece tending upwards, the ends of the lower piece tending downwards. It might be naturally feared that the margins of the pieces would be sudden or prominent. On the contrary, the margins are graduated; and, if the water have not been pressed out too freely, the continuity of the splint is so complete that they cannot be found. The armpit and groin portions should be quite freely cut out when the plaster is partially set.

I have for several years used a laminated plaster jury-mast, which fixes the head and neck in one immovable block—so immovable that, if the finger move the spine of the ilium, the head is moved at the same time; or, if the head be turned, the trunk is turned with it. The jury-mast is a layered strip (eight to ten layers), about forty-five or fifty inches long by two and a half or three wide. The deformity, if any, of cervical caries should be alleviated by horizontal mild pulley-extension, maintained by a chin and occiput sling for some weeks or months before the jury-mast is put on. It is put on thus. The patient declines on a narrow table and a mattress with no pillow, pulley-extension with webbing being kept up until the plaster sets. The prepared multiple strip, rolled up at each end, after being dipped a few moments in water, is unrolled, stretched, and smoothed; its centre is then applied to the forehead well away from the eyes; the two ends are next carried to the back of the neck, where they cross—one end being carried under the neck first, then the other. They are drawn firmly enough to closely embrace the head and back of the neck; the ends are then brought forward, and cross each other again in front of, near, the sternal notch, where they are lastly fastened by a plaster jacket laid ready to be put on in the manner I have just

described. Before the laminated strip is applied, the hair cut short, and a double strip of flannel, with cotton-wool about the ears, is applied by the same method as the plaster strip. Before the strip sets, its upper margin should be partially everted from the angle of the jaw to the sternum, giving thereby much ease to the neck, especially when the jaw is moved. Possibly the principle of this jury-mast may be carried out in other materials.

The plaster sheet-splint for fractured femur and for hip-disease is also put on in three pieces, and, when applied, forms one continuous splint, embracing the pelvis, the thigh, the knee, and the upper part of the leg. The piece first put on embraces the upper part of the thigh and the pelvis spica-wise, the ends crossing over the trochanter. Overlapping this, and fixing the ends, is the pelvic piece, which in size and position is similar to the lower piece of a spinal jacket. A third large and long piece overlaps the "spica" piece, and covers the thigh, knee, and half the leg. All these pieces are drawn under the patient, and put in place before any one of them is folded over. Moreover, the needed position is also obtained before the folding over begins. The margins of the third piece may need a cut here and there, to avoid wrinkling. The fixation is so complete that, as a rule, it is unnecessary to enclose the ankle and foot. In hip-disease, pulley-extension (put on after the position is improved under ether, if needful), with a splint on the sound side, should restore a good position before the plaster splint is put on. In due time, crutches and a patten for the sound foot may be used. This splint is cheap, durable, and simple, and, to my mind, superior to Thomas's splint. Diffuse pressure is better than the pressure of stems and bands.

Perhaps the greatest utility of the laminated splint is seen in the treatment of knee-disease, especially in that stage when chronic and persistent flexion exists. I straighten the tucked knee by a peculiar but simple method. Ether being given, extension is made from the ankle; but, what is much more efficient, direct pressure is made on the knee by means of a long broad strap of adhesive plaster thrown over the knee, the end being passed through a hole in the table underneath the knee. As you see, I have here a table full of round holes, each a little more than an inch in diameter; but one or two apertures in an ordinary table will do. In keeping up good positions while sheet splints are setting, a peg or two stuck in suitable holes help to steady the extending hands. To return to the knee, when the limb is enveloped in flannel, one assistant takes charge of the ankle, another has the strip of plaster (already fixed on the knee) in his care. A layered plaster splint, of sufficient size to embrace two-thirds of the thigh and two-thirds

of the leg, is dipped in water, unfolded and smoothed, and drawn under the limb, the knee of which lies over the opening; a slit is cut with sharp-pointed scissors in the sheet; the adhesive strap is passed through the slit and the hole; the limb is now gently but firmly drawn into position; the knee-strap, with traction made under the table, doing the greater part of the work. The best possible position being obtained, the sheet is lastly folded neatly over the limb, and the position maintained until the plaster is sufficiently set. The assistant in charge of the knee-strap fixes it in a given position by drawing it tightly against the edge of the aperture. This knee-splint should be worn several months, and renewed from time to time until the knee is practically well. A slit in a plaster sheet in no way weakens it, and the principle may be usefully adopted in applying plaster splints elsewhere. In fractures of the elbow, a band thrown temporarily across the bend of the elbow, and carried through a slit opposite the olecranon, readily keeps the parts in place until the sheet sets.—*British Medical Journal*, July 15, 1882, p. 81.

43.—CONTINUOUS EXTENSION AFTER TENOTOMY IN CONGENITAL TALIPES, WITH TARSAL DEFORMITY.

By FREDERICK CHURCHILL, Esq., M.B., Surgeon to the Victoria Hospital for Children, London.

Having had "a run" of these cases of late in my hospital practice, a brief record of the line of treatment adopted will perhaps tend to elucidate some of the difficulties experienced in obtaining permanent good results after division of tendons. Not only is it necessary that the distorted limb be placed in its rightful position by the division of parts, whether tendon or fascia, that hinder by abnormal contraction the extension of the foot, but far more important is the maintenance of the limb by continuous extension in that exact position which it is intended ultimately to assume. By forcible manipulation under chloroform many of the fibrous bands and interosseal ligaments which had helped to keep the limb in a wrong position can be stretched or divided, and the astragalus brought up to its normal position under the articulating surface of the tibia. Care, of course, must be taken so to manipulate the bones as to preserve the double arch of the tarsus. I am not one of those who think we can effect much without the division of tendons, nor do I place much faith in Scarpa's shoe as a means for counter extension. It is fortunate that with better educational advantages and improved means of transit, parents are finding their way to hospital at an earlier period than formerly. The district surgeons,

too, though well able in many cases to perform these operations, are finding out the advantage of early treatment, and the benefit to be derived from sending their patients to hospital towns, where skilful and patient continuous nursing as an adjunct to special surgical treatment is now valued and appreciated. I cannot too strongly protest against the folly of depending upon complicated and expensive mechanical appliances which fail to keep up continuous extension, though designed for that purpose. By adding weight to the already impoverished limb they rather increase than diminish the deformity. To see the children parading the streets, their limbs encased in iron, with the idea that in some unexplained way the distorted limb will come straight, is only equalled by the credulity of the mother, who, when told that iron was good for a rickety child, ordered its limbs to be encased like an ironclad with a sailor suit to match. When the deformity has become so marked that the child is accustoming itself to walk upon the sides, instead of the soles, of the feet, the joint surfaces have been so moulded by the altered position of the foot, and the tendons have become so rigidly contracted within their sheaths, that to rectify such malposition needs great care and assiduous treatment by continual pressure in the direction required to rectify the deformity. It cannot be supposed that any instrument maker, however large may be his experience, and however skilful he may be in the manufacture and adjustment of appliances, can be so acquainted with the physiological processes of repair and methods of accommodation during the period of growth as to be able to arrange for all the little niceties needful for keeping up continuous extension. As a fact, the parents too often live within a charmed circle of their own ignorance. Scarpa's shoe, with all its screws and straps, and purchased at a somewhat prohibitory price, many, presupposes to the uninitiated a guarantee of its hidden powers for self-adjustment.

As regards division of tendons, I find that the tendo Achillis requires division in the great majority of varus deformities simply because the gastrocnemius pulls the foot inwards as well as backwards during the flexion of the foot. The broad insertion of the tendon into the os calcis and the solid sheath encasing it permits of free division without absolute separation of all the attachments. By careful bandaging of the foot and leg the leverage obtained by the extensor muscles is to a great extent restored. As soon as all muscular impediment to the rectification of the foot is removed, there remains a considerable amount of distortion from the paralysed state of the extensor muscles. To obviate this I carefully apply a plaster-of-Paris bandage over a flannel "protective," bringing the foot un-

into its proper position by very firm manipulation, and keeping up this extension until the bandage has "set." By this means I succeed in procuring rigidity of appliance together with liberty for muscular effort. By galvanism and friction of the extensor muscles the tendons contract, and after three or four renewals of the plaster-of-Paris encasement the foot generally regains its normal position during the process of growth and development. Occasionally I fit a piece of webbing round the metatarsal bones and attach to the outside of it a length of solid elastic. The proximal end of this may be passed through a clip fixed to a garter below the knee. Continuous extension will in this way effect considerable rectification of the distorted parts. It will often be found useful with older children who are able to walk, and who have not such pliable and easily-moulded feet as young infants. I generally persevere for months with the treatment, and seldom require any mechanical appliance, not even in those extreme cases where the astragalus almost touches the ground.—*Lancet*, Sept. 30, 1882, p. 526.

44.—ON A PROPOSED SUBSTITUTE FOR CARBOLIC SPRAY IN ANTISEPTIC SURGERY.

By A. W. MAYO ROBSON, Esq., F.R.C.S., Lecturer on Pathology
in the Leeds School of Medicine.

The purpose of the present paper is to give the results of some experiments, which have extended over a period of two years, and which were undertaken in the hope of bringing before the notice of the profession a substitute for the carbolic spray, now used in antiseptic surgery.

About two years ago, an apparatus was advertised which created a current of air by means of a fan set in motion by clockwork, the air being forced through layers of gauze, moistened with 1 in 40 carbolic solution. About the same time, I had an apparatus made, which created a current by means of bellows, and sucked the air through a series of wash-bottles filled with 1 in 10 carbolic solution. From some experiments I made at the time with sterilised flasks, I came to the conclusion that, although the carbolic atmosphere was pure or aseptic, it was not antiseptic.

It then occurred to me that, if one could saturate the air with some volatile antiseptic, such as eucalyptol, cajuput, or peppermint, a really antiseptic air might be obtained, which, by being diffused in a room, or blown on a wound, might answer the same purposes as the spray, without having its disadvantages. I was prevented by other work from following out my idea until last September, when I made the following experiments.

The first and most essential point to be proved was, whether or not air impregnated with the vapour of volatile antiseptics is really antiseptic. To ascertain this, I sterilised a number of flasks of hay-infusion, by boiling for fifteen minutes, capping with cotton-wool, and continuing the boiling for five minutes longer; after which, to prove their freedom from life, they were placed in an incubator, and kept at a temperature of 100° Fahr. for two days. Having obtained some large wide-mouthed glass jars, capable of holding several gallons, I poured into one series about an ounce of eucalyptus oil, and into another the same amount of cajuput oil, so as to have a thin layer of fluid covering the bottom of the jar. Into these jars, the sterilised flasks, previously freed from their cotton covering, were inserted; being suspended by means of thread from a bar placed across the mouth of the receiver. The transference and opening of the flasks were rapidly performed under carbolic spray; but when they were once in the jars, there was nothing to interfere with the entrance and exit of the ordinary atmospheric air. After a varying period of exposure of from two to twenty-four hours, the flasks were recapped with cotton and again transferred to the incubator, in doing which, the usual precautions were adopted; and, in addition, the cotton which had to come immediately over the flask was just damped with a little 1 in 40 carbolic solution, to avoid the contact of germs. After being in the incubator for two days, they were put aside, to be examined at leisure.

No change occurred in the flasks through keeping, the hay-infusion looking bright and transparent throughout. There was a slight sediment in all, both in those simply sterilised and in those subjected to the action of eucalyptus and cajuput; but in no case was there a formation of scum on the surface of the fluid. In contrast to this, some flasks that had been simply exposed to the air, and then covered with cotton-wool, began to appear opaque, and scum over within a few hours.

In order that the report might be free from bias, I asked Mr. Abbott, an experienced microscopist and botanist, to examine the solution microscopically for me, which he kindly did, giving his opinion before I examined the slides.

The following are a few examples.

1. Hay-infusion, sterilised August 18th, placed in incubator for two days; exposed to eucalyptus-air for two hours on 22nd; then placed in incubator again for two days. Examined Sept. 7th, and found to be free from living organisms, but to contain very few of what appeared to be dead micrococci in the slight sediment.

2. Sterilised August 18th; incubator till 20th; eucalyptus-air for thirteen hours; incubator till 23rd. Examined Sept. 7th under $\frac{1}{8}$ objective, and found free from living organisms.

3. Sterilised August 20th; incubator till 22nd; cajuput-air for twenty-two hours on 23rd; incubator for two days. Sept. 7th, $\frac{1}{8}$ objective revealed a few still rods and micrococci, which only showed the Brownian movement, but apparently no living organisms.

Numerous flasks, acted on in a similar manner to the above, were examined with like results, except in one case, where living bacteria and micrococci were found. In this example, the usual precautions had been adopted; it failed from some cause.

The experiments related go far, in my opinion, to prove that, in the vapour of eucalyptus, cajuput, and other volatile fluids, we have powerful antiseptics, which at the ordinary temperature of the atmosphere, may so saturate the air as to kill all infective particles; perhaps not only bacteria and micrococci, but also the germs of fevers and other infectious diseases.

I have experimented in a similar manner with terebene, and have obtained good results; but, as eucalyptol is abundant, cheap, and not unpleasant, it has been selected for further tests.

In my microscope-room, which is an attic at the top of the house, and in which there are numerous organic particles, rendering the air anything but pure, I exposed flasks, prepared as above, to the vapour of eucalyptol, by scattering it on the floor, half an hour before removing the plugs of cotton from the sterilised vessels: The hay-infusions, exposed for periods varying from one to twenty-four hours to this atmosphere, for the most part remained free from germs, after being placed in the incubator; but, as the results were not always the same, I cannot vouch for this method being reliable to sufficiently purify the air for an antiseptic operation.

Hence I was led to devise a machine in which the air is first passed through a cylinder containing cotton wool, which Pasteur has proved to be sufficient to free it from germs; but, as this would only be a pure, and not an antiseptic air, it is then passed through two cylinders containing pumice-stone, over which about an ounce of eucalyptol has been poured. Thus it emerges as a pure air, loaded with invisible particles of an antiseptic, which seems to be capable of destroying any vestiges of germ-life which may have been drawn in from the surrounding atmosphere: it is directed over the desired spot by means of five coralline nozzles, which act on a ball and socket-joint, capable of being fixed in a certain direction by a screw. The bellows were obtained from Mr. Fletcher of Warrington, and give a continuous current at a considerable pressure. Messrs. Meyer and Meltzer make the entire machine. The fol-

lowing cases from my own practice and the practices of other surgeons will illustrate the use of the apparatus :—

Case 1.—Mr. G., after suffering for three weeks with onychia, called to consult me, with inflamed and suppurating axillary glands. On April 27th, I opened the abscess under eucalyptus-air, getting out about two ounces of pus. I put in a drainage-tube, and dressed the wound with salicylic silk. The instrument and hands were dipped in 1 in 40 carbolic solution; but the wound itself was neither syringed nor sponged with carbolic solution. On April 29th, the matter had perforated the dressing, which was changed, and the drainage-tube removed. On May 1st, the wound was dressed in the same way. There was thin fluid on the dressings, but no pus. There was no redness round the point of incision; and the discharges throughout were quite sweet and free from bacteria, as proved by microscopic examination. On May 4th, the wound was healed. Before the incision, the temperature was 100° to 101° for several days, but never above normal after the opening was made.

Case 2.—Mrs. G. had been confined three weeks. She had previously caught cold, and had a gathered breast, which was intensely painful and very much enlarged. On April 29th, I opened the breast under the eucalyptus-air, and dressed with salicylic silk. On May 1st, the drainage-tube was removed. She had no pain since the operation, and felt quite well. The discharge was aseptic, and there was no redness round the wound. On May 5th, the dressings were removed. The wound was healed.

Case 3.—Miss C. had an aneurysm by anastomosis of the scalp, which was removed under eucalyptus-air on May 1st. On May 4th, the dressings were changed. The wound had run an aseptic course throughout.

Case 4 was one of strumous disease of the finger with abscess, which was opened freely on April 27th. On April 29th, it was dressed. There was little discharge; the wound was aseptic and free from organisms. On May 3rd, it was healed.

Case 5.—Miss P., suffering from chronic pyæmia following caries of ribs, had a parotid abscess. On May 1st, the abscess was opened under the eucalyptus-air, and an ounce of pus let out. It was dressed once a week for several weeks, and ran an aseptic course. No pus was seen after the first dressing, and the small amount of fluid showed no trace of bacteria.

Case 6.—Mr. L. was the subject of large varicocele, which he was anxious to have radically cured. On July 10th, the operation of cutting down on the veins, ligaturing them at the external abdominal ring and at the testicle, and then cutting the varicocele away, was done under the antiseptic air. A

drainage-tube was inserted, and salicylic wool-dressing applied. The wound was dressed on the 11th, 13th, and 15th; its course was aseptic, and it healed on the latter date.

Mr. T. Pridgin Teale removed a return growth of scirrhus of the breast on April 27th, under the eucalyptus-air. Mr. Ward, House-Surgeon of Leeds Hospital, who kindly reported the case to me, said that the wound pursued a strictly aseptic course until it was healed. In this example it is only fair to say that the wound was wiped over with a carbolised sponge before being closed up; which, however, is the course usually adopted when the carbolic spray is used.

Mr. Teale has also adopted the eucalyptus-atmosphere in other cases, one of which was a large fatty tumour of the side; and in this example no carbolic acid was allowed to come into contact with the wound. The wound remained aseptic and the temperature normal throughout.

Dr. Clouston has been good enough to allow the eucalyptus-air to be used in four cases of empyema. He tells me that the course in all the cases was aseptic; and in one of these examples the dressings were examined, and found to be free from organisms.

Mr. Spencer Wells, who kindly used my first crude machine, sent me the following account of an operation:—

“June 9th. I amputated a breast under your eucalyptus-vapour, put in a drainage-tube, used sutures to unite the skin up to the tube, and dressed it with salicylic wool. I did not touch it for three days; then removed the tubes under the eucalyptus-vapour; put on more wool; left this four days; then removed the sutures. Union by first intention up to opening left for the drain. No fever; no sign of any putrefactive process. Drain-opening now closed.”—*British Medical Journal*, Sept. 2, 1882, p. 420.

45.—ON THE TREATMENT OF FRESH WOUNDS.

By JOHN DUNCAN, Esq., M.A., F.R.C.S.E., Surgeon to the Royal Infirmary, Edinburgh.

I suppose that as the recipient of discharge, as a protection from external irritants, as a means of retaining parts in contact, or for other reasons, some form of dressing is required in the treatment of wounds. The ideal surgical dressing is one which, while effectually meeting these ends, requires no interference until the wound is healed. If and when this can be attained, the rapidity of healing will be determined simply by the vigour of the individual, and pain and anxiety will be absent from patient and surgeon.

Many attempts have been made to attain this end. Mr. Lister's methods keep it in view; M. Guerin has aimed at it in his cotton-wool dressing, and Mr. Gamgee has strongly supported a similar treatment. I have recently made some experiments in the same direction, using the salicylized wool introduced by Professor Thiersch.

Three obstacles to a permanent dressing present themselves. These are the sutures, the drainage, and the antiseptics.

A wound cannot heal quickly unless the contact of its surfaces be reasonably close. The more accurately the edges are approximated, the more certain are they thus to heal. This accurate apposition can only be brought about by sutures. To attain, then, the object which we have in view it is first of all necessary to have sutures which can be absorbed by the tissues, and we find our wants to a great extent met by carbolised catgut. But the chief difficulty in the use of sutures undoubtedly lies in the tension to which they subject the textures. If the tissues are perfectly lax, and union by the first intention take place, the new material which unites them is sufficiently strong in three or four days to resist the normal elasticity of the cutaneous envelope. In such cases a fine catgut would last for the necessary time. But inasmuch as, from exudations of blood or serum, or from other circumstances, either the union may be somewhat delayed or the tension somewhat greater, it is well that the catgut be of such a quality and thickness as to secure it from absorption for seven or eight days. More than that is unnecessary. It is a mistake to suppose that the use of a permanent material, as wire, silk, or horse-hair, enables you to resist tension. The fact is that if a wound be perfectly lax, sutures are of use only in maintaining steadiness, while on the other hand, if the tension is such that the wound requires support against it after the first week, any ordinary suture which may have been left in will have cut its way through the skin, and, so far from doing good, will add to what inflammatory action may be present.

There are cases in which, from deficiency of skin or from other causes, we must be prepared to encounter much tension, and I believe that under healthy and aseptic conditions we may attain union of any surface which we can bring into apposition by manual pressure, and which can be so maintained without cutting off its blood supply. But in such circumstances we must distribute the pressure and take it off the margin of the wound by buttons or quills, being careful so to apply them as to get the maximum of relaxation at the edge with the minimum of pressure on any one point. It is not in virtue of the permanent nature of the material, but because of the distribution of pressure, that we meet with our success. Even thus

tension is not entirely evaded. These sutures are not without their disadvantages. The material which unites the buttons tends, of course, to pass from one to the other by the shortest route, and in doing so produces ulceration, which is none the less real because it is not always visible on the surface. In septic wounds it is frequent, and in aseptic it occurs that supuration forms in the track of such sutures, and, if it do so, is apt to be dammed back by the button. They ought, therefore, to be taken out as soon as possible. Of them, also, it may be said that in most cases they have fulfilled their mission in ten days; and unless the tension be very great indeed, and the union very sluggish, I find they may be safely removed in that time.

Plainly, then, catgut, especially if chromicized, may be used to unite the buttons instead of silver wire. When it is absorbed the buttons will lie harmlessly under the dressings, in simple contact with the skin. I have used this means of buttoning in cases where the tension was really considerable, and with admirable effect; but I have not yet ventured to discard wire when much force was required. I have, in short, long given up every suture but catgut for the edges of a wound, and only occasionally use the silver wire and buttons for relaxation.

If, then, we can get a dressing which otherwise we may leave on indefinitely, there is little impediment in the sutures. In most cases catgut may be used, and in the others a renewal of the dressing at the end of a fortnight will allow of their removal. This limitation, however, there is from the side of the suture.

Drainage is in many respects an admirable invention, and in some aspects the recognition of the principle it involves is one of the most marked improvements of modern surgery. But I have no doubt whatever that it may be carried too far. In suppurating and septic wounds it may easily become a source of irritation. As a rule, in these cases, if a drainage-tube have not fulfilled its purpose in a week, the meaning it is that is badly placed or insufficient, and in any case that a new departure must be made.

In fresh wounds, again, it is evident that if we can approximate the condition to that of a bruise we have little need for drainage. No one would think for a moment of converting a simple into a compound fracture merely with the object of evacuating the blood and relieving tension. The tension and extravasation of blood is often very extensive after severe contusion, but we await absorption with the most perfect confidence, certain that suppuration will not occur unless the conditions of constitutional health or local destruction of tissue be highly unfavour-

able. Now, after an injury inflicted by the surgeon, although in many cases the constitutional state may be bad, the local injury ought to be more favourable than in a severe bruise. The tissues are sharply cut and perfectly viable, and the vessels are tied so carefully that serious distention should not occur. If, then, there were no other intercurrent circumstance, drainage ought to be unnecessary. But by almost universal concurrence of opinion it is held to be necessary. The reason is to be found in the admission of air and its contents. It is because the results of such admission are the conversion of the harmless fluids of a bruise into virulent and deadly poisons, which can only be prevented from producing their pyrogenous and phlogogenous effects by immediate evacuation. The most perfect examples of the character of these products are met with in abdominal surgery, and the most beautiful results of drainage are there also seen. The bloody serum to which Dr. Marion Sims has recently been drawing attention is the source of the evil. But why? No one will pretend that a little bloody serum in the peritoneum would produce an evil effect unless there were a wound. It does not do it after an operation for strangulated hernia. It only does it in a few ovarian operations. Plainly because only in these few has it been poisoned from without. And the results are there rapidly fatal because the surface on which the poison exerts its phlogogenous action is so enormous and its means for entering the circulation so free.

Well, then, if the antiseptic theory be true and its practice moderately feasible, we have no need for drainage on this account. It is not necessary to drain the bloody serum, because the bloody serum is innocuous. But it is said that the irritation of antiseptics increases the flow of serum from the wound, and renders drainage necessary to avoid tension. Practically I doubt the truth of this observation; at least the discharge is not of such amount or kind as to make any demand for special means of drainage in the majority of our cases. On the contrary, because it is serous it flows easily through the interstices between the sutures, and it is certain that its flow ceases in a very short time. I find that if a wound remain antiseptic drainage-tubing is rarely required.

I have come to this conclusion after trying all sorts of absorbable tubing, catgut, decalcified bone, and other forms. The catgut is unnecessary if the wound be aseptic, is inefficient if it suppurate. The others last too long if the wound goes on well, melt and soften in a few days in purulent discharge. A good example of the behaviour of Neuber's tubes was seen in an amputation of the ankle. It required no dressing after operating, until at the end of a fortnight I thought we might find it healed. It was so, but the large tube which had been inserted

at one corner projected unaltered. I could not withdraw it, because its deeper part was firmly incorporated with the tissue. I pressed the soft parts back, cut the tube off short, and a week afterwards found it covered over. It had simply acted as an impediment to healing, and had been utterly useless from the first, for there was not a tablespoonful of dry blood in the dressings. Drainage, then, I regard as usually unnecessary in aseptic wounds in which the ligature of vessels has been properly performed, and in which the deep surfaces are kept in close contact so as to induce any slight ooze to pass outwards.

Undoubtedly if accumulation were to take place it would delay healing by keeping surfaces apart, although I do not find that in aseptic cases it tends to cause inflammation or raise the temperature. Still it is to be avoided, and there are wounds in which it is nearly certain to occur if special precautions be not taken. In these indiarubber or glass is the best material, but it ought to be removed as soon as possible, and a special dressing for the purpose is advisable on the night of operation or the following day.

There yet remains for consideration the influence of putrefaction and its prevention.

There are two methods whereby the evils of septicity may be avoided—to prevent the entrance of the germs of putrefaction, and to render the soil unsuitable for their multiplication. The first and most important involves all that minute attention to detail in cleanliness and the use of germicides which Mr. Lister has so thoroughly established. His dressings fairly accomplish this object, and the results attained are admirable. But the second is scarcely less important. It is less important because, if the entrance of noxious influences be prevented, it would matter little what the nature of the soil might be. But undoubtedly germs creep in notwithstanding all precautions, and it is of great moment that they should find conditions unsuitable for their multiplication. I suppose, for example, that the chances of a wound becoming septic are much greater in a diseased than in a healthy man, that the germicide properties of healthy tissues are much stronger than those of diseased textures; and it is certain that the results of septicity are much worse in the weakly than in the strong. This object, of course, involves the care of the patient's general condition. But the soil may also be rendered unsuitable for germination by means applied locally.

I have sometimes thought that perhaps we are too timid in our application of antiseptics to wounds. I have had exceedingly good results from carbolic irrigation. I excised the os calcis in a patient of Dr. Sidey's whose wound, septic before, remained so after operation. The temperature rose alarmingly,

and we thought the patient would die of septicæmia. Irrigation was established by three worsted threads, which led into the cavity continuously for a fortnight a stream of 1 to 40 carbolic lotion. Yet the patient suffered in no way from carbolic poisoning, while the symptoms of septicæmia disappeared, and healing went on steadily, though slowly. But whether or no highly septic discharges should in some instances thus be charged with an antiseptic, we have other methods of rendering a fresh wound unfavourable to the propagation of germs. Two of these seem to me specially important. Dryness is highly conducive to safe and rapid healing. Moist warmth favours all forms of decomposition, and promotes exudation. Careful arrest of hemorrhage, and a covering at once dry and permeable, are therefore strongly indicated.

Again, accurately applied compression is an aid to quick union, because it brings together and keeps in immediate contact parts which may at once adhere, and which thus also come, as it were, within striking distance, and so exercise their germicide properties with success. Further, it helps to arrest the exudation of blood from the capillaries and smaller vessels, and prevents bagging of the wound.

Now the mode of dressing by gauze and mackintosh, while reliable for the exclusion of septic influences, is in these ways imperfect. It is an immense improvement on the old painful daily dressings. But it produces moist warmth. It does not lend itself readily to equable compression. It cannot be used as a permanent dressing. It requires renewal weekly, because the antiseptic is in that time exhausted at the temperature of the body. Doubtless exhaustion of the antiseptic would do no harm unless the discharge were sufficient to reach the edge of the dressing. If you cover an aseptic fluid with a few layers of gauze or with a single layer of mackintosh, it will remain for any time and at any temperature untainted. But the mackintosh keeps the skin underneath it moist from perspiration, and even were there no discharge from the wound, putrefaction would occur so soon as the antiseptic was sufficiently exhausted.

Considerations such as I have endeavoured to explain, and many clinical attempts with this and that method, have gradually led me to adopt a style of dressing which enables me in a large proportion of cases simply to lay the patient aside till his wound has healed. The method is as follows:—The wound is carefully and accurately stitched. If it be large, an interval of an inch or less is left between two of the stitches at some convenient part, and if, from the nature of the wound, firm compression throughout is uncertain, a few of the catgut ligatures are left long and brought out at the interval, or an india-

rubber drainage-tube is inserted. In most cases it is completely closed. A piece of dextrinised oiled silk is applied. Mr. Lister's object in this application is to protect from carbolic irritation; but were it not that it also prevents adhesion of the dressings, I should not consider it of importance when the edges of a wound are carefully approximated. One layer of moistened gauze is the next covering, and over it a thick padding of dry salicylic wool, firmly compressed by a gauze bandage. The layer of gauze facilitates the ultimate removal of the dressings. Without it the wool, irregularly hardened by the dried blood, forms a sort of cuirass and is apt to stick. I have tried silk instead of wool as a dry dressing. It does not, however, produce the same equal pressure throughout.—*Edinburgh Medical Journal*, July, 1882, p. 38.

46.—ON A MODIFICATION OF LISTER'S ANTISEPTIC TREATMENT.

By JAMES L. LITTLE, M.D., Professor of Clinical Surgery in the University of the City of New York.

In a paper on Lister's "Antiseptic Method of Treating Surgical Injuries," which appeared in the "American Clinical Lectures" for 1878, I called the attention of the profession to a modification of this procedure, which I was then using in the treatment of small wounds, especially those of the hand and fingers. I have since continued its use, and have found the results, in a large number of cases, so satisfactory that I have deemed it of sufficient interest and importance to justify my calling your attention to it in a short paper this evening.

Although having full confidence in Mr. Lister's antiseptic method, I, like many others, have long recognised the great difficulty that must needs be experienced by the general practitioner in attempting to carry out the minute details of the dressing, and have for a long time been hoping that a more simple method, equally efficacious, might be devised.

Dr. Markoe's "thorough drainage" was a decided step in this direction—antiseptic in character, simple in detail, and successful in result. This method, however, is appropriate only where drainage is necessary, but, simple and efficient as it is, it requires a certain degree of attention, which, while easy for the hospital surgeon, is not sufficiently so to guarantee its extended use by the physician in charge of a large general practice.

Aside from the difficulties incident to the application of Mr. Lister's dressing, it has been found that surgeons in country towns distant from large cities have great trouble, and often are unable, to procure good antiseptic gauze at the time when

it is needed. This would not be so embarrassing if, in the first place, the gauze was fresh when obtained from the dealers; and, in the second, if it could be kept for a reasonable time without spoiling. This, however, is not the case. The gauze sold in most of our stores is frequently not in an antiseptic condition. As to its keeping fresh, Dr. R. F. Weir has demonstrated conclusively that even when kept wrapped up in rubber cloth and in a box it will deteriorate in a few months.

In assisting in surgical operations, I have in several instances found that the gauze used had no odour whatever of carbolic acid, although it had just been purchased from a responsible dealer in this city. In my own practice I have been obliged to depend for a reliable gauze on the kindness of the authorities of one of the hospitals with which I am connected.

Furthermore, the materials necessary for fully applying Mr. Lister's dressing are somewhat expensive, a very important fact when we consider that the majority of accidents and operations that call for this procedure occur among those who are able to bear but little expense.

I have for several years been surgeon to a large factory in this city, in which three thousand hands are employed, and where injuries by machinery are quite frequent. These injuries consist chiefly of wounds of the hands and fingers, caused by their being caught in the cog-wheels and other parts of the machinery. In many cases the fingers are torn off, tendons are pulled from their sheaths, joints are opened, and the hands are often severely crushed and lacerated. In all of these cases I have, for the past six years, been using the following simple antiseptic dressing: Having put the parts in a condition for dressing, I wash the wound in a solution of carbolic acid of the strength of one to twenty; I then cover the parts with a thick layer of borated cotton, and then snugly and evenly apply a simple gauze bandage. At first I used bandages made of antiseptic gauze, but for the past three years have used those of plain uncarbolicised cheese-cloth. These thin bandages distribute the pressure more evenly over the cotton, and are more easily saturated with fluids than those made of unbleached muslin.

The patient is instructed to keep the outside of the dressing wet with a solution of carbolic acid of the strength of one to one hundred. I frequently employ Squibb's solution of impure carbolic acid, which is of the strength of one to fifty, and which, when mixed with an equal bulk of water, gives a solution of the desired strength.

The parts should be kept at rest, and the dressings may be left undisturbed for several days, unless there is pain, rise of

temperature, or discharge through the dressings. These conditions are always to be considered indications for redressing.

In many cases where rubber drainage tubes have been used they may be removed at the second dressing, and, if catgut has been used for sutures, this second dressing can be allowed to remain on for an indefinite period. In a number of cases of lacerated wounds I have allowed the first dressing to remain on until the wound has entirely healed. In these cases the external use of carbolic lotion was discontinued after the fifth or sixth day, and the dressings would become dry and hard, the wound healing, as it were, "under a scab."

The patient should be instructed to loosen the bandage at once if any pain occurs.

My experience with this dressing covers, as I have said, a period of about six years, during which time I have treated nearly three hundred cases of open wounds. Not one of this number has been followed by inflammatory symptoms. Extensive lacerated wounds have healed, and dead tissue has sloughed away, without giving rise to any of the so-called symptoms of inflammation. Neither pain, redness, heat, swelling, nor constitutional disturbance has resulted. In no case has there been reddening of the lymphatics or tenderness of the glands. No counter-openings have been necessary. Pain has been entirely absent, so that anodynes have not been needed, save in a single case, and that for one night only, to control slight restlessness.

These results are the more remarkable from the fact that many of these patients were in an unhealthy condition, some suffering from anæmia, some from cardiac disease, phthisis, and the like.

Recently I used this modified dressing in St. Vincent's Hospital, in a case of amputation of the leg. The history of the case is as follows:—

The patient, a boy nine years of age, was run over by a dummy engine, on September 28th. His left foot was crushed so that it was necessary to amputate the leg at the junction of the middle with the lower third. The operation was performed by Dr. John F. Luby, the House Surgeon, in my presence. The method of amputation was that by lateral skin flaps and circular incision through the muscles. All the details of Lister's method were employed except the spray. Catgut was used for ligatures and sutures. Short drainage tubes were placed in the anterior and posterior angles of the wound. After the wound was washed with a one-to-twenty solution of carbolic acid, it was dressed with several layers of dry borated cotton and a gauze bandage was applied. The outside of this dressing was kept constantly wet with a one-to-forty solution of carbolic acid.

The great and the second toe of the right foot were also crushed, so as to require amputation at the second joint of the great toe and at the metatarso-phalangeal articulation of the second toe. These wounds were dressed in the same manner.

October 2nd. Four days after the operation. Patient has not complained of any pain. His highest temperature has been 99'8° F. Has slept well, and has a good appetite. On removing the dressing, the cotton was found not to have been wet through by the carbolic-acid lotion. The layer in direct contact with the wound was saturated with a watery discharge. The wound was in a perfect aseptic condition. The drainage-tubes were removed and fresh borated cotton was applied.

October 7th. The boy has been perfectly comfortable during the past five days. On removing the dressings very little discharge was found on the cotton. The wound was entirely healed, except at the points where the drainage-tubes were inserted. The external application of the carbolic lotion was discontinued.

October 15th. Dressings removed, and the wound found to be entirely healed, except at a small point at the lower angle. The wounds of the right foot were dressed simultaneously with that of the stump. Although a small portion of the integument sloughed, there was no trace of inflammatory action. Granulations sprang up and the wound rapidly closed, so that on October 17th the cotton dressing was discontinued and unguentum resinæ was applied.

This case did as well as any case could have done under the most rigid Lister dressing.

The value of cotton-wool as an antiseptic dressing is, I think, not fully appreciated by the profession. M. Guérin, of Paris, in 1872, and since then Mr. Gamgee, of Birmingham, England, have called attention to its great value. Used in the way I have indicated, it seems to me to be as perfect an antiseptic dressing as the gauze and other materials recommended by Mr. Lister, while at the same time it is free from all objections that pertain to the latter, and which materially hinder their use by the general practitioner. If applied in sufficient quantities around an open wound, it protects it thoroughly from the "floating matter of the air" which is supposed to be the real inciter of suppuration. It is the best germ filter known to us. Tyndall, whose experiments were very carefully made, found that while filtering the air, and endeavouring to get it perfectly pure, atmospheric dust, which would readily pass through sulphuric acid and a strong solution of caustic potash, was completely stopped by ordinary cotton-wool.

I have used the very excellent borated cotton made by Mr. Am Ende, of Hoboken, containing 15 per cent. of boracic acid.

Keeping it wet externally with the solution of carbolic acid, in the manner already described, renders it more surely antiseptic. (A great deal of the so-called borated cotton sold by dealers is made with a solution of borax, instead of boracic acid, which can always be ascertained by burning a piece of the cotton; if the cotton has been properly prepared with boracic acid, the flame is of a bright-green color, but, if, as is generally the case, borax has been used, the flame will show very little of the green tint.)

To insure success in the cases where the dressing is used, full precautions as to rendering the instruments, sponges, and the hands of the surgeon aseptic, and the use of drainage-tubes if necessary, should not be neglected. Catgut or torsion should be used to arrest hemorrhage. The spray may be resorted to, if thought necessary, at the second dressing. I now usually apply carbolised oil, of the strength of one to twelve, to the wound to facilitate the removal of the cotton, which is otherwise apt to adhere after the first dressing.

I would state, in conclusion, that my experience thus far seems to show that this simple dressing, so easy of application, is as thoroughly antiseptic as Mr. Lister's appliances, and that it has the very decided advantage of doing away with the necessity for using costly "protective oil-silk," "Macintosh cloth," "carbolised gauze," etc., and gives us a dressing that can be used by any one under any circumstances, be it in the city or in the country. The borated cotton is easily kept for months unchanged. The fact that the dressing need not be done oftener than once in several days will especially commend it to the country physician.

The success of this procedure in the treatment of large wounds after accident or amputation will increase its importance, and materially extend its field of usefulness.—*New York Journal of Medicine*, Dec. 1881, p. 571.

47.—ON IODOFORM WOUND DRESSINGS.

By SAMPSON GAMGEE, Esq., F.R.S.E., Consulting Surgeon to the Queen's Hospital, Birmingham.

The use of absorbent gauze and cotton pads and bandages, variously treated with antiseptics, has gained in favour with British and foreign surgeons. The experiments, which my friend and colleague, Professor Bostock Hill, was good enough to carry out at my suggestion, proved that the absorbent materials lose none of their physical properties when treated with borax, iodine, tannin, and other similar substances, amongst which iodoform holds a high place. The poisonous tendency of carbolic acid dressings has become well known,

especially since the publication of Mr. Pearce Gould's case before the Clinical Society of London. That iodoform is also highly poisonous is not even denied by Mosetig-Moorhof, although he has employed it with advantage in 7000 cases; and Professor König of Göttingen has published a special warning on the subject. For efficiency and safety I give preference to a solution of iodoform in absolute alcohol (1 to 10, after Esmarch), and a similar proportion of iodoform and collodion (Göges); the latter is a hæmostatic and antiseptic preparation of special value in the management of tracheotomy wounds during diphtheria, and of operations on the rectum and vagina. The eagerness with which different absorbent materials, variously treated with antiseptics, have been adopted by particular surgeons, offers a noteworthy contrast to the comparative indifference with which the general principles underlying simple and efficient wound-dressing have been apprehended. Immobility and perfect drainage, elastic compression, and infrequent dressings are the essentials. These secured, the dynamics of the circulation are so perfectly under control, innervation is so little interfered with, that nutrition and repair proceed with a minimum of stasis and effusion, and practically without any decomposition. But the reception of any discharge that does occur, in powerfully absorbent and antiseptic pads, is obviously conducive to purity, and opposed to infection.

At the recent international Medical Congress I exhibited a slice of meat which had remained dry, clean, and sweet after being kept for twelve summer days between two of my pads. I hope shortly to be permitted to record the results of experimental researches, conducted with a view to determine the relative antiseptic merits of absorbent pads and bandages differently prepared. Meanwhile, with a view to facilitate independent inquiries, I have made arrangements with Messrs. Southall Brothers and Barclay, manufacturing chemists of this town, to forward on application sample packages of absorbent pads, bandages, and splints prepared with pleasantly scented iodoform and other antiseptics, ready for immediate wound treatment.—*Lancet*, May 13, 1882, p. 774.

48.—ON ABSORBENT DRESSINGS IN THE TREATMENT OF WOUNDS AFTER OPERATION.

By WILLIAM BERRY, M.R.C.S. and L.R.C.P. and S., Ed., Hon. Surgeon to the Royal Albert Edward Infirmary, Wigan.

For some time I have used dry and infrequent dressings for my surgical cases in our infirmary here, and am so well satis-

fied with the results that I wish to relate a few cases thus treated. In treating the cases mentioned I have not been particular as to the material employed; sometimes fine oakum, other times absorbent wool, and salicylic silk also, have been used, neither did I mind having the wool made antiseptic, though no doubt this is an advantage where the discharges are fetid or unpleasant. In treating operation wounds I have striven to observe the *three* cardinal points—namely, (1) rest, (2) drainage, (3) pressure, based on physiological laws, and so much insisted on by Mr. Sampson Gamgee, of Birmingham, in his admirable little work on the Treatment of Wounds, and to whose kindness I am deeply indebted both for a supply of materials and many valuable suggestions. The convenience of this dressing can only be appreciated by the surgeon who constantly uses it, and, so far as my experience goes, the results will bear favourable comparison with other modes of treatment. In wound treatment we should particularly observe the three heads above-mentioned, for by employing a dry and absorbent material next the wound, with firm and equal pressure and drainage, so as to allow the escape of all fluids from the wound, we render the necessity for dressing infrequent, and have everything favourable for healing. The importance, also, of observing the temperature chart closely each day, will enable us to discover the progress of the case; and so long as we have a temperature under 100° F., and the dressings externally dry and comfortable, we may leave the parts untouched without fear or risk to our patient.

The following cases have been satisfactorily treated by this method.

Case 1.—Compound Comminuted Fracture of Thigh in a boy aged five years; Amputation of the Upper Third; Recovery.—J. Mc—, aged five years, was admitted on February 4th, 1882, with a compound comminuted fracture of the right thigh, which he had sustained half an hour previously by getting entangled in the wheels of a cab. The femur was fractured in two or three places, the muscles torn and broken, and the knee-joint opened. Amputation at the junction of upper with middle third of thigh was performed by transfixion. All the bruised muscles were removed and the flaps brought together, the edges being secured by wire sutures. The stump was padded with absorbent cotton, a splint and bandage applied. He rallied very well from the shock and his temperature did not exceed 100° till the fourth day after operation, when it was 101·8°; after changing the dressing it went down in the evening to 98·8°. The dressings required changing about every fourth day; the temperature, however, again rose to 101·8° on the seventeenth day, but this could only be accounted

for by one or two small abscesses on the other leg from bruises. The stump was almost healed by February 28th. A little red lotion and boracic lint was applied to hasten cicatrisation. He was discharged to his home but readmitted a week after owing to a small superficial ulcer in the face of stump, and a few days after he was changed to another ward and took erysipelas of stump and other leg, but this subsided after appropriate treatment, and he was discharged on May 25th.

Case 2.—Scirrhus of Breast and Axillary Glands; Excision; Wound of Vein; Recovery. (For notes of this case I am indebted to Mr. A. W. Stone, junior house-surgeon.)—J. F——, aged thirty-four years, single, factory hand. Admitted March 25th, 1882, with the following history:—Has had good health all her life until three or four years ago, when she felt a lump the size of an egg on the outer side of right breast; this was not painful, but tender to the touch; it gradually increased in size till now, when it is about the size of a closed fist. No retraction of nipple, but a nodule of hard tissue two inches above breast, and the axillary glands appeared enlarged. Could find no family history of cancer. On March 30th the breast was removed by an incision, which was carried into the axilla, and the glands here were found much larger and more matted together than at first sight appeared. The vessels were completely surrounded by hard masses; these were removed, and in doing so the axillary vein at its junction, with the cephalic, was wounded; two ligatures were applied. After the glands were removed and the bleeding stopped, a drainage-tube was inserted, the edges of wound carefully brought together by wire sutures; pads of salicylic silk and a bandage were applied. The temperature was 100° the morning after operation, and there was some pain all along the arm, which was enveloped in flannel. The temperature was never more than 100° F., and after dressing on the third day the temperature was normal and remained so. After the first few days carbolic tow was used owing to the abundance of discharge, but the wound granulated well, and she was discharged cured on May 14th, 1882.

Case 3.—Myeloid Tumour of Femur; Amputation through Hip-joint; Recovery. (I am indebted to Mr. Stone for notes of this case.)—H. D——, aged nineteen, single, clogger, was admitted on April 19th, 1882, under the care of my colleague, Mr. Monks, and for whom I took charge of the case. His family history revealed no hereditary disease, and he himself enjoyed good health until he was thirteen years of age, when he was in the infirmary for five weeks, suffering from “rheumatics in both knees.” He was discharged cured, but says he has had the same complaint about once a year ever

since. On March 17th he slipped and fell, and hurt his knee. This had been treated with rest and cold applications. On his admission he complained of great pain and inability to move the joint; there was a globular swelling in front, extending a little upwards on the femur, and also on each side of the joint. The tumour was elastic and semi-fluctuant, and appeared to extend into the joint. Circumference at upper edge of patella sixteen inches and a half, and considerable pain on pressure. The patient was ordered to bed, and a back splint applied to fix the knee, lead lotion constantly applied, and five grains of iodide of potassium three times a day given internally.—May 10th: Measurement over knee at edge of patella, seventeen inches and a half; pain much increased; compound soap pill every four hours. I now took charge of the case for Mr. Monks.—May 18th: Pain very great. Leg one inch and a half shorter than the other, measures seventeen inches and a half over patella. Patient decidedly cachectic looking. A consultation of the staff being held, an exploratory incision went through the bone into a soft, reddish, and pulpy mass. The majority of the staff thought amputation through the hip-joint should be performed, and Mr. Woodcock, one of my colleagues, undertaking to control the hemorrhage, an Esmarch elastic tourniquet with a roller was applied round the abdomen. I proceeded to make the anterior flap by transfixion, Mr. Woodcock following the knife with his fingers. The femoral was secured, and the posterior flap made. The limb was disarticulated without much trouble, and the arteries secured with catgut, the bleeding having stopped (little blood being lost), a drainage-tube was placed between the flaps, and the edges brought together by wire sutures. Absorbent cotton was evenly placed around the flaps, and a bandage applied. The man was in a state of collapse, but with the administration of warm drinks gradually rallied. His temperature chart from the time of his admission till now shows a temperature varying from 100° to 103° F. The morning after the operation there was a feeling of sickness and exhaustion, although he had had a tolerably good night. Temperature 103° ; this declined, but on the 22nd, four days after the operation, it rose to 103.8° . The dressings were removed, the edges of the wound found looking well. After cleansing the parts, absorbent wool was applied. The temperature had fallen next morning to 98.2° .—May 24th: Morning temperature 98.2° ; evening 102 . He feels better, and takes liquids better; no solid food allowed as yet. Dressings changed. The case now progressed favourably without interruption, the sutures being removed when found to be useless, and supports from strips of plaster took their place. He was discharged on June

20th, with the wound quite healed and much improved in general health.

Case 4.—Compound Comminuted Fracture of both Bones of the Leg; Secondary Amputation below the Knee; Re-amputation (Carden's); Recovery.—M. C——, aged twenty-six years, single, a brakesman, was admitted on March 29th, 1882, with a compound comminuted fracture of both bones of the leg. This was put up antiseptically. Cellulitis, however, supervened, and eight days after he had an evening temperature of 103° . On April 5th amputation was performed just below the knee-joint, and dressed antiseptically. The temperature fell to 99° in the morning, and 101° in the evening. On April 13th, eight days after amputation, the evening temperature rose to 103° . Quinine and antipyretics were now given freely, but on May 8th his evening temperature rose to 105° . This declined to 102° after relieving the stump of some pent-up pus. On May 15th the evening temperature registered 104.8° , and on the 17th 104.6° , and pus was found in the knee-joint. On May 18th I took charge of the case, and amputated through the condyles of the femur (Carden's operation). An abscess cavity was found running between the muscles, half way up the thigh; this was sponged out with carbolic lotion. The flaps were united with wire sutures, and a drainage-tube inserted. Absorbent cotton-wool was applied, and a back splint evenly bound on with a bandage. The temperature the same evening was 102.6° , and the next morning 99° .—21st: Evening temperature 103.8° ; patient feels much better; losing his hectic appearance; dressings changed; stump looking well; healed in several places.—May 25th: Seven days after amputation the temperature was 98.4° in the morning, and 99.6° in the evening. Four more dressings served to complete the healing, the sutures being removed as occasionally required. Three weeks after the operation the stump was quite healed, the man much improved in health and strength, and he was discharged cured on July 4th, 1882.

Through the kindness of Mr. Gamgee I have just received from Southall Brothers, Birmingham, some iodoform pads for surgical cases. They are exceedingly nice and light. It is much better to have the absorbent wool enveloped in a thin absorbent material, so as to prevent its adhering to the wound.—*Lancet*, Oct. 21, 1882, p. 656.

49.—WOUND DRESSING—LAWTON'S ABSORBENT COTTON.
By R. PROSSER WHITE, Esq., M.B., Senior House-Surgeon,
Halifax Infirmary, Yorkshire.

Absorbent cotton-wool is the product of American ingenuity, and is thrown upon the market as a dressing suitable for every purpose where a dry surgical dressing is required, and it is

advertised to possess qualities giving it advantages over other forms of dry dressing. Its value can only be estimated from the results of clinical experience.

The sample of absorbent cotton-wool submitted to my notice was a piece of very finely carded cotton : upon comparing it with ordinary fine cotton-wool one was struck with the white, almost metallic, lustre of the former, upon squeezing the absorbent cotton it gives a rough crackling sensation very much like freshly fallen snow when pressed in the hand. This crackling sensation is possessed to a slight extent by other medicated cotton-wools and is a fair test that the wools are fresh and that their absorbent properties have not been deteriorated by exposure to damp and moisture. A familiar experiment with Lawton's cotton is the readiness with which it sinks in water, ordinary cotton remains floating almost indefinitely. Salicylic cotton possesses this property of sinking rapidly in water, almost equal to the absorbent cotton. If we place these three wools upon oil the absorbent and salicylic cotton sink most quickly, but ordinary cotton-wool in this fluid is not far behind its more absorbent rivals. For glycerine again the absorbent and salicylic wools show a decided affinity and very shortly sink, ordinary cotton remains floating a long while. The amount of water that absorbent cotton will hold in suspension is decidedly greater than either salicylic or ordinary cotton. 3ss. of absorbent cotton saturated with water and hung up for 10 minutes will suspend 3ij. more water than either of the other two wools of the same weight and placed under the same circumstances. Thick fluids will filter through salicylic, absorbent, and ordinary cotton-wool in the following respect, viz., ratio 9 to 13 to 20 in time.

From these foregoing experiments this special wool possesses absorbent properties greatly in excess of ordinary cotton-wool, and this not only in crystalloid but also in semi-colloid fluids, and it compares favourably with other wools made absorbent by the suspension of antiseptic or other crystalloid substances in their texture.

Our next point must be to consider its advantages as a dressing to wounds, and it will at once be admitted that it is a soft easily applied and comfortable dressing, and one which admits of an equable pressure being applied to the parts, a very important point and one which cannot be said of all the dry dressings of the present day.

The secretions of a wound may be roughly divided into two portions—the solid and the fluid, the solid being those parts of the tissue that slough together with the corpuscles, either of blood or of pus ; the fluid part consists of the serum. If we filter the secretion of a wound through absorbent cotton, the blood

corpuscles, the serum, and if the filtrate be placed under the microscope a few of the pus-cells will be found, but the main bulk of the pus-cells will be found not to have filtered through even a thin layer of the cotton; and this is what occurs on applying the absorbent cotton wool to a freely suppurating wound, part of the serum filters through the cotton, but the cells form an impermeable coating on the inner layer of the dressing, and gradually joining, the dressing, runs along the least resisting points and appears at the border of the dressing. When thorough antiseptic precautions have been taken, or the wound has been one where there is little discharge, I have seen excellent results in cases under the care of Mr. Wright in this hospital, such as in the removal of small tumours from the breast, the dressing has been left on for three or four days, healing has taken place by scabbing after very few dressings, and with no discomfort.

The uses of absorbent cotton wool are, I believe, as follows: It is the best medium for applying remedies in gynæcological cases; it is a valuable medium to apply such medicaments as styptics; it is a useful dressing when equalised pressure is required, and holds a prominent position as a dry dressing to small wounds without much discharge; but as an immediate dressing either to large wounds or to wounds with a profuse amount of discharge its use is contraindicated.

The perfect dressing has, in my opinion, not yet made its appearance; its structure should, I believe, be on some such lines as the following: its meshes should not be all of the same size, or at least should be large enough to allow all the excretions to freely pass through its superficial layers. The fibres should not all run parallel with the surface of the skin, and to admit of this it seems desirable that the material should not be homogeneous. Its inner surface should be devoid of all irregularities to admit of its perfect adaptation to the surface of the wound. It should be aseptic and powerfully absorbent; it should be clearly elastic; and last, but not least, it should be cheap.—*Medical Press and Circular*, April 26, 1882, p. 56.

50.—ON BORO-GLYCERIDE IN OPERATIVE SURGERY.

By RICHARD BARWELL, Esq., F.R.C.S., Senior Surgeon to Charing Cross Hospital.

There can be no doubt that the dressing of operation-wounds, by some material, and in some method, that shall prevent fermentation or putrefaction of their secretion, greatly promotes their safety, and is almost a prophylactic against those secondary constitutional effects which

we know by the names pyæmia, septicæmia, etc. But there is great doubt as to whether the particular method introduced by Mr. Lister is the best means of obtaining the object in view. It certainly is a very inconvenient one; and, although in hospital practice we may easily, and in the practice of a town, where distances are small, may with some difficulty provide or transport all the cumbersome paraphernalia required, the method can hardly be carried out in the rural practice of a wide district, especially if operation be needed on a sudden emergency. In military surgery, during war time, it is simply an impossibility.

Time will not allow me to discuss here the probable uselessness of the spray directed upon the wound. Certain is it that the pulverised stream and the eddies it produces cause more atmospheric dust to fall on the bare surface than would otherwise be the case. If we give full credence to the germ-theory, and believe that germination of certain parts of this dust is the direct cause of putrefaction, it must, nevertheless, be acknowledged that, however rapid the reproduction may be, it yet occupies an appreciable time. Therefore if, no spray being used, the wound is immediately washed with the germicide, whatever it may be, we can quite as effectually destroy those micrococci that may have been deposited as we can do while yet they are floating in the air.

But carbolic acid is a topical and general poison. The local irritation is such that the wound has to be guaranteed against its continued contact by a material termed protective; and even then, pretty severe irritation, causing excessive wound-secretion, is the rule rather than the exception; and, when the cancellous bone-structure of young subjects is laid bare, as in excisions, a local osteomyelitis is very apt to be produced.

The absorption of carbolic acid by the wound has been deadly, but has more frequently been not quite fatal. In the early part of this year (February), I removed a fibroma from a lady's back, under the spray, and used the usual mode of carbolic acid dressing. That night I was sent for, and found my patient apparently sinking. A little urine had been passed about an hour before; it was quite inky. There was frequent vomiting, and nothing could be retained on the stomach. Pulse 48; breathing 31, very shallow; pupils rather contracted, scarcely responding to light. That this was not the vomiting of ether was shown by the fact that, when I visited her about four in the afternoon, she had only vomited once, and had taken some food without difficulty. The operation was at nine in the morning, and the distressing symptoms came on almost exactly twelve hours after. Besides using the spray, the wound had been filled with a 3 per cent. solution of

carbolic acid ; but, as I had placed a good pad over it, all must I think have been squeezed out.

Impressed by these considerations, but chiefly by the records of carbolic poisoning, I have for some time past been endeavouring to find a reliable safe antiseptic. Thymol, in my hands, entirely failed, nor has the eucalyptus answered my expectations. Boracic acid seemed to me the most reliable substance. I found it, however, very unmanageable, and was actually engaged in trying to overcome certain difficulties, when, on April 1st, 1882, Professor Barff's lecture on the preservative qualities of boro-glyceride appeared. Mr. Barff courteously at once complied with my request for a sample ; and, after a few experiments, which I may be excused for omitting, I began its use on the human subject. I have brought some of this substance with me ; it is, as will be seen, a soft solid, softer now than in colder weather ; by placing the bottle for a while in very hot water, the material comes to be of the consistence of treacle. I do not conceive that the solution of boracic acid in glycerine—for this is merely a saturated solution in the hot fluid—confers upon the former any new quality ; it merely renders it more manageable, especially more soluble in water, and more miscible with other substances.

The mode in which I generally use it is as follows. For economy's sake, I generally cleanse my hands and instruments, also the patient's skin, with carbolic acid. I then operate in the open, without any spray or further precaution. The operation completed, the wound is thoroughly mopped and sponged with a 5 per cent. solution of boro-glyceride in water (that is, one ounce to a pint) ; or, in case of a cup-shaped wound, I fill it with the solution. After this, the wound is stitched and covered with eight or ten layers of lint, and, where necessary, as in amputations, also with a light bandage similarly soaked. The whole is then enveloped in thin mackintosh ; if no oozing take place, there is no need for dressing again for three or four days, sometimes for more. When the dressing is removed, all parts of the wound where the lips have been adjusted are found united or uniting, according to the time elapsed, the surrounding skin being entirely free from redness or any sign of irritation ; it is, on the contrary, soft and white like that of a baby. One point in the dressing which I have left till now is the drainage, whether it be desirable or not. My cases, of which I will immediately give a summary, have not enabled me to decide that point with absolute certainty. In two cases in which I omitted that appliance, one had for two days a temperature of 99.5° to 99.8° ; one for three days a temperature of 100.2° to 101.0° , a mere traumatic, not a septic, temperature, since it began at once, and ended in

from forty-eight to seventy-two hours. Others, notably a breast case, with glands extracted from the axilla, making a deep hollow, had no fever at all.

My cases show clearly that boro-glyceride is not only a perfectly reliable antiseptic, but that it promotes rapid healing of wounds.

Of three amputations of the mamma, one cannot heal quickly, because I was obliged in one part to leave rather a wide gap, but even in these, wherever the lips were in contact, union took place in five days. Of the other two, one was double, and the wound was enormous, at one place its edges would not be quite adapted, yet I sent the patient back to Mr. Hughes, her attendant at Deal, on the eleventh day; all healed save a small granulating spot. Of the third case, to which I was called by Dr. Farr, of Kensington, I can only say, that the rapidity of healing was almost marvellous. She had no pain nor fever, and sat up for half an hour on the third day.

In one amputation of the thigh, I used as my diluent vaseline; it did not do as well as an aqueous solution. The other amputation of thigh was healed in six days, save one spot where a suture had been insufficiently secured, and the skin therefore allowed to gape. Had it not been for this piece of carelessness, I would have boasted of getting a thigh amputation well within a week; as it is, the man got up on the seventh day. The other amputation healed very well, although such complications as hæmaturia, probably indicating tuberculosis of the kidneys, will keep the lad long under care. The other cases need no comment.

I would point to the fact that the ease and celerity of dressing, and the absence of a spray wetting everything within its radius, are a great gain to the patient as to the surgeon. The simplicity of arrangement, the freedom from cumbersome apparatus, render this method particularly well adapted for military surgery, and for practice in rural districts, and I firmly believe it will be found to conduce quite as much as any other method to the absence of blood poisoning, and more than any other to rapidity of convalescence.

Let me also call attention to the use of this material for injection into the bladder in cystitis. When the mucus and urine are inclined to decompose and to become ammoniacal, this compound acts like a charm. I have found it invaluable if any irritation arise after litholapaxy.—*British Medical Journal*, August 26, 1882, p. 362.

51.—ON BORACIC GLYCERINE.

By C. E. SHELLY, M.B. Cantab., Hertford.

It will be interesting to learn, from those whose practice and experience enables them to speak authoritatively on the subject,

whether—as Mr. Balmano Squire suggests—boracic glycerine can be made to take the place of carbolic acid in all the operations of antiseptic surgery. That it can be so used in certain cases, and with advantage, I feel sure; *e.g.*, when a wound, treated antiseptically with carbolic acid dressings in any one of the usual methods, has become almost superficial, and begins to respond too vigorously to the irritation of even weak carbolic oil, it will heal more readily and kindly under lint moistened with ordinary “glycerine of borax,” than if treated with simple water-dressing, or with dry lint. This may be proved by simultaneously treating two similar wounds on the same limb, or two different portions of a large superficial wound, by the two methods, and noting the rate of progress and the result in each case. Ulcerated superficial wounds, once they have been cleaned and stimulated into healthy action, usually heal very readily under this treatment. But, in deep, or lacerated, or contused wounds—those from which we would expect, under ordinary circumstances, a good deal of suppuration—the boracic glycerine has disappointed me, and has seemed much inferior in usefulness to carbolic acid; and I think that the powerfully hygroscopic qualities of glycerine which come usefully into play when the main business in hand is the formation and protection of young epithelium, are, at best, of doubtful value in lesions involving greater depths of tissue. On the other hand, in dealing with weak, pale, and flabby granulations, boracic acid lacks that quality of sufficient irritating power which, when responded to, we term stimulation. I apprehend that the chief value of glycerine as a vehicle of the germicide boracic acid lies in the fact of its being in itself aseptic, protective, and hygroscopic, and not subject to evaporation at ordinary temperatures. I have often found boracic glycerine a pleasant and successful application in cases of *tinea circinata* and of *pityriasis versicolor*.

In the summer of 1874, I first showed that the action of glycerine upon borax was a chemical one—boracic acid being set free; since then, I have in the case of infants who have to be brought up by hand, often ordered the addition of a few grains of borax to the milk, which is at the same time sweetened with glycerine instead of with sugar; milk thus treated is less apt to become sour in hot weather (borax is often added to milk, especially in the summer months, in many large dairies); and children thus fed would seem to suffer less frequently from “thrush” than do those fed in the ordinary way on cows’ milk and with equal attention to cleanliness. A similar treatment of the milk-food of infants and young children has served to prevent or mitigate the simpler forms of summer diarrhoea. A little borax, boracic acid, or—if the milk be liked sweetened—

a little glycerine of borax, is probably, also, an useful addition to the milk ordered for enteric fever patients.

I have only lately learnt that, in 1878, Messrs. Senier and Lowe published papers in the journals of the Chemical and the Pharmaceutical Societies, showing that when ordinary sodic biborate, or borax, is dissolved in glycerine, boracic acid is set free. while more basic borates, having a constitution between mono- and bi-borates, remain behind; and proposing to utilise this fact as a test for glycerine. Glycerine, however, although peculiar, does not stand alone in this respect; the salts of ammonia also have the power of decomposing borax and setting free boracic acid (Woodcock, Jour. Chem. Soc., xxiv., p. 785)—a power which should not be overlooked in medical practice or prescribing.

May I take this opportunity of again calling attention to the fact that the common glycerine of borax, B. P., is *not* “an alkaline combination,” as it is often stated and considered to be; in proof whereof, anyone who will add a strong solution of bicarbonate of soda to an equal quantity of “glycerine of borax” in a lightly corked phial, will voluntarily make the experiment which is sometimes unwittingly and disastrously performed by the dispenser who trustfully mingles these ingredients in accordance with the unguarded directions of an apparently innocent prescription.—*British Medical Journal*, May 13, 1882, p. 726.

52.—RECENT DEVELOPMENTS IN ANTISEPTIC SURGERY.

By the EDITOR OF THE BRITISH MEDICAL JOURNAL.

To those whose acquaintance with antiseptic surgery dates back to the time when the carbolic dressing of Lister was first introduced, and can remember the rigid ritual enjoined in its use, the last substance added to the surgeon's armamentarium must be the source of some quiet amusement. It appears that, about two years ago, a man applied to Dr. G. Neuber, assistant in the clinic of Professor Esmarch in Kiel, with the story that, eight or ten days earlier, he had suffered a severe accident to the forearm, which had resulted in extensive laceration of the soft parts, rupture of the wrist-joint, and fracture of both bones of the forearm. The first dressing applied to this severe compound and complicated fracture was a thick coating of mould from the moor on which the man was at work. After burying the limb in this, a rough wooden splint was applied. When, ten days later, the man came into Kiel, he appeared to be in good general health; and, after the astonished surgeons had thoroughly removed the whole of this primitive dressing, they found that the wound was free from suppuration—in some

parts already united by first intention, in others granulating in a satisfactory manner. Struck by this brilliant result, Dr. Neuber proceeded to investigate the antiseptic qualities of turf-mould. These qualities were already being recognised in other quarters. It had been found that the turf, which is of a remarkably fibrous and friable character, acted as a powerful deodoriser of faecal and other like offensive substances. A company has been started for the purpose of popularising the new material, under the name of "moss-litter," as a bedding for horses; and the mould has been used in the latrines of infantry barracks in Brunswick. We recently inspected a large range of new stabling erected by a railway company, in which the "moss-litter" was extensively used, and was found to act so effectually as a deodoriser, that the same bed could be used for two or three months. Dr. Neuber found that the dust or fine powder arising in the preparation of the moss-litter for the market also possessed a powerful affinity for ammonia, carbonate of ammonia, and other products of decomposition. A series of experiments in the use of the mould as a surgical dressing were made, and the experience gained may be thus summed up. The turf-mould, reduced, as we gather, to a powder, is enclosed in gauze bags which have been thoroughly washed in carbolic acid solution. The bags are made of two sizes, and the mould in the smaller is mixed with iodoform in the proportion of 2·5 per cent.; the mould in the larger bag is saturated with a solution of carbolic acid (5 per cent.). In applying the dressing, the wound is first washed with carbolic or with chloride of zinc lotion, or powdered with a little iodoform. The small bag is then placed over the wound; over that a large bag is adjusted; and both are retained in place, and an equable pressure kept up, by a gauze bandage. The dressing was used by Professor Esmarch in fifty-five cases, among which were included seven resections and osteotomies, five amputations, twelve extirpations of tumours, and two herniotomies. The results were most satisfactory. The only death was in a case of advanced tabes dorsalis, where the operation of nerve-stretching was followed by pyæmia. In thirty-one cases there was no fever at all; in only five cases was it necessary to remove the dressings, owing to either local or general disturbance; and, as a rule, they were left in place for a fortnight. The advantages claimed for the mould are, briefly, that its absorbent power is so great that wounds remain perfectly dry under its use; that it absorbs the products of decomposition, and probably checks their formation; that the pads are very soft and elastic, easily adapting themselves to the surfaces of the limbs and trunk; and that, finally, turf-mould affords the cheapest known antiseptic, since it costs only about one-ninth

as much as the carbolic gauze (Listerian) dressings. In a second communication, Dr. Neuber gives the results in a second series of cases, among which were instances of ovariectomy, hysterectomy, and operations for floating kidney. This second series of seventy-eight cases resulted in but three deaths, due respectively to tetanus, to delirium tremens, and to gangrene of the leg after resection of the knee in a "bleeder." Where it is proposed to leave the dressing undisturbed for a fortnight or more, Dr. Neuber applies glass bandages externally.

Very different is the opinion which appears to have been formed at Kiel with regard to the use of iodoform. It was used in cases of so-called tubercular joint-disease, but the results obtained were not at all so good as in a similar series of cases where the Listerian dressing was used; the joints were laid open, scraped, and the cavity then either filled up with iodoform, or dusted over with it. The conclusion is, that the method is not quick, is not radical, and does not protect the patient from relapse. The grand objection to its use, however, lies in the dangerous symptoms of poisoning by which the use of iodoform has been followed, and which are particularly apt to occur in the very cases where its use otherwise would offer the greatest advantages—namely, in operations about the mouth and air-passages. Dr. Neuber has to record two deaths from iodoform-poisoning after operations about the mouth, the symptoms being of the character described in an article on page 913 of our last volume. He advises that not more than about a drachm of iodoform should be used at any one dressing, and that the gauze or wool used should not contain more than ten per cent of the drug. Dr. Schmid, on the other hand, from experience gained at the Augusta Hospital in Berlin, believes that iodoform has a specific action on the tubercular process in joint-disease; he, however, seems to have obtained equally good results with dressings of salicylic acid in operations on bones. After the removal of a sequestrum, he fills up the cavity with powdered salicylic acid, and covers the wound with salicylic wadding; the dressing is left undisturbed for a week or a fortnight. In this method he puts sometimes more than six hundred grains into a wound at one dressing, yet he has never had a single case of salicylic poisoning. Dr. Hahn (*Berliner Klin. Woch.*, 24, 1882) has used iodoform in severe cases of extirpation of the uterus through the vagina, six of which were successful; he dusted the vagina wound with iodoform, thoroughly powdered the vagina with the drug, and finally plugged the canal with iodoform-gauze. At the end of twenty-four hours, the vagina was thoroughly washed out with a solution of salicylic acid, and the iodoform reapplied. In this method, the iodoform is applied to the vaginal wound through

a speculum, and can be seen to come into direct contact with the intestine.

Yet another antiseptic has been used recently in London, at Charing Cross Hospital and at St. Bartholomew's Hospital among others; this is boroglyceride, which was introduced in the early part of this year in a lecture by Professor Barff; he recommended it as a preservative for meat and other kinds of food. Great powers of arresting decomposition being claimed for the new body, it was not many days before it was in use as a surgical dressing. As supplied by the manufacturers, it is an opaque white substance, not unlike boracic ointment, but freely miscible with water, to which it imparts a faint milky tinge. It is a body of definite chemical composition ($C_3 H_5 BO_3$), which forms a definite hydrate with a large quantity of boiling water, and is not, we are informed, decomposed when diluted in the proportion useful in surgery—namely, one part to twenty or thirty of water. Such a solution is inodorous, it has a slight saltish state, and is quite unirritating to a wounded surface; under its use, wounds of all kinds do extremely well, and heal fully as rapidly as under carbolic acid dressings, over which boroglyceride has the advantages that it does not irritate the wound or the surrounding skin, and that it is, so far as is known, entirely innocuous when applied to a wounded surface.—*British Medical Journal*, Aug. 26, 1882, p. 371.

ORGANS OF CIRCULATION.

53.—ON ANEURISM OF THE POPLITEAL ARTERY.

By THOMAS BRYANT, Esq., F.R.C.S., Senior Surgeon to Guy's Hospital, &c.

Case of Aneurism of Both Popliteal Arteries: one cured by Pressure; the other by means of Dr. Fleet Speirs's Artery Constrictor, after the failure of Esmarch's Bandage, the operation being conducted under strict Antiseptic precautions.—Henry B., a stonemason, aged 48, was admitted into Guy's Hospital on February 25th, 1882, under my care, for double popliteal aneurism. The patient had been a hard drinker, and had had syphilis thirty years before. He was married, and the father of seven healthy children. He had enjoyed good health up to two years before his admission, when he became an out-patient at the hospital for pain in the chest. He remained under treatment for two months, and left relieved; during this time he followed his occupation.

Six months ago, the pain returned; but, by obtaining lighter work, he could get on, and it was not until twelve days before his admission that he was obliged to give up work. He had

discovered a swelling in the right popliteal space six months before admission, his attention having been drawn to the part through pain. He likewise discovered a like swelling in the left space at the same time; but in it there was no pain. He had had a cough for some months, but no expectoration. He had also a right inguinal reducible hernia.

On admission, he presented a pale emaciated appearance, with an anxious countenance. He had a pulsating swelling in each popliteal space; and the pulsation was readily controlled by pressure upon the femoral artery above. The aneurismal sacs were firm, and could not be much emptied. The femoral arteries were large and rigid. The heart's action was far from healthy, and gave a harsh loud diastolic *bruit*. The area of the heart's dulness was enlarged. The pulse was only 44 in the minute, and irregular: it was full and splashing. No thoracic aneurism was made out; but all the arteries of the body were more rigid than normal. He had a harsh cough, like that found in aortic disease.

The man was put to bed, and allowed moderate diet, without stimulants. On February 28th (third day), digital compression, aided by a weight, was applied to the right femoral artery; and the pressure was maintained for thirteen hours. On the following day, pressure was applied for eight hours; on the third, a Reed's tourniquet was adjusted and kept on for forty hours. Little good was produced by this treatment, although the sac was possibly a little harder than it had been. The man's condition was, however, unsatisfactory; all local treatment was, therefore, suspended for three days.

On March 8th, the tourniquet was reapplied, and kept on for fourteen hours. On March 10th, digital pressure was recommenced, and kept well applied for twenty-four hours, at the end of which time the sac was hard, and pulsated but little. On the 11th, 12th, and 13th, pressure was kept up by means of a tourniquet for some hours daily, with but little change. On the 14th, 15th, and 16th, digital compression, supplemented with a weight, was reapplied; and on the 17th the aneurism was hard and non-pulsatile. It was evidently cured.

The treatment had been carried out for eighteen days, with three days' interruption: but the result was good. During the period of treatment, the patient had repeated hypodermic injections of morphia, but never more than one-eighth of a grain at a time.

The man was then left alone for ten days, during which time the cured aneurismal tumour much contracted, and the patient's general condition improved. At the end of that time, the left aneurism was taken in hand, and treated as the right had been—that is, by digital compression, when it could be

obtained, supplemented by weights, and by means of Reed's or Skey's tourniquet, during the intervals. Little or no good was, however, derived from the treatment; and, after ten days' trial, an Esmarch's bandage was employed, the pressure of the bandage being so arranged as to allow the sac to be well filled with blood, and the circulation in the supplying and efferent arteries arrested. The bandage was kept on for one hour; but the action of the heart became so disturbed as to excite a fear that it would stop; and it is a great question whether life would have been preserved, had the bandage not been removed when it was. Moreover, no good effect was produced on the aneurism. The patient was then left entirely alone, and in a few days he was himself again. The treatment by pressure was, however, given up, and the obstruction of the artery by a cutting operation determined upon.

The operation was performed on May 12th, and consisted of four stages: 1. The exposure of the artery by a clean incision; 2. The constriction of the artery with the largest sized loop of a Speirs' constrictor; 3. The obstruction of the lumen of the artery by breaking up its inner and middle coats by means of the constrictor and the subsequent formation of a blood-clot at the injured spot; and 4. The washing of the wound with an antiseptic lotion composed of three drachms of liquor iodi to a pint of water, and the careful adaptation of its edges with its subsequent dressing. It should be added that the artery was very large, and apparently thickened.

The operation proved eminently successful. The artery was as easily obstructed by means of the instrument employed as by the application of a ligature. All pulsation ceased at once in the aneurism after the removal of the instrument, and never returned; and when the dressing was first removed on the seventh day, the wound had entirely healed. There was no more secretion from the wound after the operation than enough to stain, not saturate, the dry dressings that had been applied; there was no pain in the part throughout the process of repair; and the temperature of the patient never rose above normal. Subsequently, the aneurismal sac rapidly contracted, and convalescence was established. The man was kept in bed for three weeks after the operation, as a matter of precaution; and, when he left the hospital, he had complete use of his legs, and both aneurismal tumours had contracted down to masses about the size of walnuts.

Remarks. — If this case had been nothing more than an example of double popliteal aneurism cured by treatment, it would have been worthy of record; but since it illustrates many important points in surgery, I have deemed it worthy of being brought before this meeting.

1. It demonstrates how, in the same patient, one of two aneurisms similarly placed may be cured by digital and instrumental pressure, while the second, although subjected to the same treatment, and by the same hands, will fail to be so affected. The fact fairly demonstrates the truth of what is now generally accepted by surgeons, that the cure or non-cure of an aneurism by pressure is determined more by the relations of the aneurismal sac to the artery, and the nature of the orifice of the aneurismal sac, than by anything else.

2. It illustrates one of the dangers of the treatment of an aneurism by Esmarch's bandage; and shows how, throwing back upon the general circulation the blood that would have been coursing through a lower extremity, is a real source of danger; more particularly when the valvular arrangements of the heart are at fault, as they clearly were in the case now under consideration, or when the organ is fatty. This danger was fully recognised by me when the case first came into my hands for treatment; and it was from its recognition that this method of treatment was not primarily employed. I was led to give the treatment a trial upon the cure of the first aneurism and the failure to cure the second, with the hope that I might avoid the necessity of a cutting operation in a subject which could not be regarded as a favourable one for operative treatment. I feel now that the experiment was most dangerous, for the frightful disturbance of the heart's action which came on soon after the bandage had been applied, and its rapid increase in severity during the whole period it was maintained in position, has assured me that the man's life was in great danger; and that, had he not been carefully watched, and had the bandage not been removed when it was, a fatal result might have been expected. Indeed, I am convinced of what the subsequent progress of the case proved, that it would have been wiser to have submitted the patient at once to operative interference than to have done what I did.

3. The case demonstrates very forcibly the value of Dr. Fleet Speirs's artery-constrictor in bringing about the occlusion of an artery, even when that artery is thickened and enlarged, and the patient is not one of the most favourable for operative interference; since, in the case related, the wound healed rapidly and kindly, without pain, swelling, or overaction, indeed, without any of the many complications to which the repair of deep wounds is liable to be retarded. That a like result would not have been brought about had the artery been ligatured with prepared catgut, or any other animal ligature, I am not prepared to assert, for my own experience could supply the possibility; but such an argument can in no way destroy the fact that in this case, in which a novel method

of occluding a large artery has been employed, the very best kind of repair followed, and was completed in the very best way.

The method of Dr. Fleet Speirs brings about an immediate division, and a certain amount of recurvation of the inner and middle coats of the artery, the external coat being left intact; and, later on, the formation of a clot at the injured part, with the exudation of plastic lymph, and, as a consequence, the permanent occlusion of the injured vessel. Indeed, the method seems to do to a vessel by design what surgeons at times meet with in practice as the result of an accident, and it apparently does this well.

I have described this operation as having been performed with "strict antiseptic precautions"; and I have done so advisedly, for I think it would be well for surgeons to know what is meant by this now very common expression. Is it to be understood as applying solely and wholly to the spray-and-gauze system as carried out by Lister and his followers? or is it applicable to any of the antiseptic methods of dealing with or dressing wounds?

If the expression is to be confined to the Listerian or spray-and-gauze system, my claim to have performed the operation I have recorded "under strict antiseptic precautions" is unjust, for it was not employed; but if the expression is applicable—as I claim it to be—to other systems or methods in which antiseptics are systematically employed, my description is just; for I thoroughly cleansed and washed my wound in this case with one of our best antiseptics (warm iodine-water) before adjusting its edges, and covered the wound with lint soaked in terebene 1 part, and olive-oil 3 parts, guarding the wound from external atmospheric influences by means of a large fold of lint, and keeping the limb in absolute rest. I did this, moreover, with the very excellent result I have recorded. Indeed, I treated this wound in the way I have habitually treated the majority of my operation and other wounds for the last ten years, and with such good results that I am not disposed to deviate from it.

By way of conclusion, I believe that we have, in this instrument of Dr. Speirs, a valuable means at our disposal for bringing about the occlusion of a large artery in continuity; and, although I am not disposed to make too much of the success of one case—the first, I believe, of the kind which has occurred in this country—I am bound to say that Dr. Speirs reports to me that in his own city of New York it has been employed with success in at least three cases of carotid, one of femoral, and one of brachial aneurism.

From the success of this case, I shall certainly employ the

instrument again ; and I would like my brother surgeons to give the method a trial. The instrument may be had at Messrs. Krohne and Sesemann's, at 8, Duke Street, Manchester Square. —*British Medical Journal*, Oct. 14, 1882, p. 721.

54.—ON THE CHOICE OF MATERIAL FOR LIGATURE OF ARTERIES IN THEIR CONTINUITY.

By BENNETT MAY, ESQ., B.S., F.R.C.S., Surgeon to the Queen's Hospital, Birmingham.

We may assume, at the present day, that the choice is narrowed to some form of animal tissue as silk, catgut, or the strip of ox-aorta recently advocated by Mr. Barwell. Which-ever is used, it is cut short, and the wound closed over the foreign body, in the hope of obtaining primary union. The best material is that by which this requirement is most surely fulfilled, and which, at the same time, effects a permanent barrier to the circulation. Silk, even the best, and with the most careful antiseptic precautions, cannot be relied on for the former purpose. Though the peritoneum has the power of encapsulating it, the connective tissue only does so as a lucky accident, and, more often than not, strangulation of the outer coat of the vessel proceeds to ulceration, by which the ligature is cast loose. By means of catgut, a true subcutaneous ligature can be insured ; but the second point, that of permanent occlusion of the vessel, has not been so certain.

The first note of distrust was struck by the well known case of the late Professor Spence, in 1869, in which the catgut then in use softened and relaxed its hold on the common carotid, and with a fatal result. It is fair to say that this, and other cases occurring at the time, were not treated with antiseptic precautions. Since then, Professor Lister's incessant labours in this line have culminated in the chromicised catgut, which "will retain its hold on a vessel for three weeks, and yet become absorbed or encapsuled." This appears the perfection of a ligature ; but, if it may be permitted, I hope to offer some practical observations upon its action.

During the past year, I have ligatured four large arterial trunks in their continuity, for aneurism, and with only one slight departure from an uniformly good and perfect result. This break occurred in one case in which chromicised catgut was used in preference to the older form of common catgut which I employed in all the others.

The cases include one of ligature of the brachial artery, two of the superficial femoral, and one of the external iliac. Listerism was carefully carried out in all, the treatment of each

wound as regards drainage, dressing, etc., being as nearly as possible identical.

In all but one (superficial femoral), the ligature used was a piece of common catgut (No. 3), which had been kept in stock in carbolic oil a long time. The wound in each of these cases healed at once and entirely, without any tendency to the formation of a sinus; and in all, the aneurism rapidly consolidated, without any sign of returning pulsation. The ligature was tied as tightly as possible, and in a very secure reef-knot.

In the remaining case, I used chromicised catgut, and in this the wound did not heal throughout its entire length; for at one point a small sinus formed, which remained open six months. This sinus had every appearance of leading down to the point of ligature, but no loop has ever come away, though watched for. The remainder of the wound healed at once in its entirety; but at this one point, and it was not the line of the drainage-tube, it failed to heal over the ligature. It could not be induced to close, and remained open long after the patient was quite well and at work. The natural inference is, that there was some failure of antiseptic precautions, or that the drainage was imperfect; but neither of these appeared to be the case at the time. It is a reasonable alternative to suppose that primary union failed owing to the nature of the material used; at least, it appears less easy to secure primary union over this material than over ordinary gut, but there is not the same fear of the destructive process of ulceration as with silk.

As the case of ligature of the external iliac artery has been one which leaves nothing to be desired in course and progress, I would add a few particulars. The patient, a man aged 40, was the subject of a large inguinal aneurism extending above Poupart's ligament for some distance. He gave a history of direct violence to the vessel two years before, viz., the pressure of the hand-rail of a heavily laden hand-cart. He had had syphilis, and was a heavy spirit drinker. A high incision was made, so as to avoid stripping the aneurismal sac of its peritoneum, or otherwise disturbing it, to reach a healthy part of the vessel, and even, if necessary, the common iliac. The ligature was a piece of common catgut as described, tied as tightly as possible. The wound was treated antiseptically, and on the fourth day, when dressed, was found soundly healed throughout its length; no disturbance of the union ever occurred. Pulsation in the aneurism ceased entirely on the application of ligature, and never returned. The aneurism rapidly hardened and contracted, and is now imperceptible. The vitality of the limb was never for a moment in doubt. One advantage of the rapid union in this locality is a scar with scarcely any tendency to hernial protrusion.

The good result in these cases is to be ascribed to the perfect antiseptic precautions adopted, by which primary union and consequent subcutaneous ligature were brought about. The same object was also furthered by inflicting a minimum of disturbance on the tissues during the operations. Professor Lister points out that the advantages of the gut ligature are forfeited unless perfect antiseptic treatment be adopted with it, because, otherwise, the outer coat of the artery must die, and suppuration ensue.

In my case of ligature of superficial femoral, in which the use of chromic gut was followed by an intractable sinus, I believe there was no failure of antiseptic treatment; and I submit that the failure to obtain primary union was owing to the material employed, and that some samples of chromic gut are over-prepared, or over-hardened, so as to form a very hard wire-like substance.

In conclusion, I may say that I am well satisfied with stout common gut of good quality, improved by long keeping in carbolic oil, as a material for ligature which leaves little or nothing to be desired; and it is a matter of surprise to me that such fancy methods of treatment of aneurism as Esmarch's bandage, from which I have seen fatal disaster in the most simple cases, should still find a place for discussion.—*British Medical Journal*, Oct. 14, 1882, p. 734.

55.—A METHOD OF APPLYING LIGATURES TO VEINS.

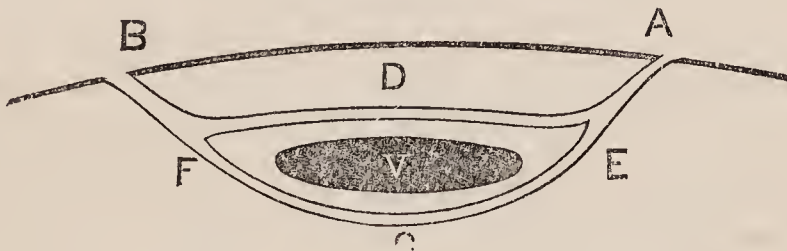
By HENRY SYDNEY, M.D., C.M., Hounslow.

In applying a ligature to a vein, or adopting any mode of occlusion, inflammatory action is both inevitable and requisite. The form of phlebitis required is the healthy aseptic variety, with its limiting zone of plastic formation passing across the lumen of the vein and its solidified contents and preventing purulent matter or the results of disintegration from entering the circulation. The variety to be dreaded is the septic, where phlogogenous matter, zymotic or chemical, penetrates the tissues before the defences of the limiting zone can be formed, and diffuse suppuration is the result. If septic inflammation were due only to germs introduced from without, it might be hoped that strict antiseptic precautions would prevent it, but there is every reason to suppose that it can arise from the formation and absorption of a material not of a zymotic but a chemical nature, due to decomposition or retrograde metamorphosis of tissue or wound products. According to Billroth, the surface of a healthy granulating sore or a zone of healthy plastic formation is impermeable to septic organisms, but where, from the presence of crushed or devitalised tissues,

the wound is unhealthy, septic material, either formed within or introduced from without, can be absorbed into the system. Now, in the ordinary mode of occluding veins by acupressure or subcutaneous ligature there is, in addition to the vein, a large amount of skin and other tissues seized, compressed and more or less devitalised; and consequently conditions are produced favourable to unhealthy tissue metamorphosis and absorption. This may appear a theoretical rather than a practical view, or a refinement of the septiphobia, now so extensively prevailing in the surgical portion of the profession, but it is nevertheless a very palpable possibility, if not probability, and one which, in view of the still questionable reputation of operations of complaisance on veins, cannot be allowed to pass unheeded. But from whatever point it is viewed, the principle of enclosing within ligature or acupressure tissues other than the vessel to be occluded is wrong, and whatever proceeding tends to limit the action of the ligature to the vessel only, excludes an element of danger. Whether the dangers of operation on veins are exaggerated or not, it is easily conceivable how on these busy highways of the system results are apt to follow grave in proportion to the ease with which, ceasing to be local, they become general, and therefore an essential precaution in operations is antiseptic procedure. A punctilious regard to cleanliness may obviate the employment of the redundant ceremonial of full antiseptic measures. Either the spray or the irrigator may be used. I have, when operating by ligature, had equally good results from both. I have also had perfect freedom from suppuration and sepsis, without either spray or irrigator, from an application to the skin of a thick ointment composed of wax, olive and eucalyptus oil and carbolic acid. This smeared over the parts forms a coating sufficiently thick, at the temperature of the skin, to prevent the contact of air with the punctures. In regard to the operation itself, it should, after the plan of Ricord and Duncan, be subcutaneous, and the ligature of catgut. The ligature should be very fine: No. 1 size only. This for two reasons: because it requires less force to cause complete occlusion of a vessel with a thin than with a thick ligature; and a thick ligature embraces a greater portion of tissue, and therefore causes a greater amount of bruising and destruction. The disadvantages and even the danger, in the case of arteries, of using thick catgut, have been pointed out by Mr. Barwell and Mr. French. The ligature should not be in that rigid condition in which it usually is from being kept in carbolic oil, as, after soaking in the fluids of the wound, it becomes softened and elastic and in that condition stretches after tying, which, be it ever so little, is sometimes sufficient.

to prevent perfect occlusion. To soften the ligatures, they may be soaked in a 5 per cent. solution of carbolic acid before being used. I find that the addition of a small quantity of eucalyptus to the carbolic oil in which they are usually kept makes them soft and elastic. In this condition, as in tying with horsehair, a double turn must often be made in the first knot, to prevent it slackening before the second can be brought to fix it. The vein only, with as little surrounding tissue as possible, should be included in the ligature. Not only is there less tissue bruised or devitalised, but less force is required to produce complete occlusion, just as an artery is more easily controlled by pressure on its bared trunk than over super-imposed structures. With this object I employ two needles—a long sharp-pointed one, and a blunt grooved one to act as a director. The sharp needle is first thrust underneath the vein, and its point brought out through the skin on the opposite side. It is then withdrawn a sufficient distance in its track to allow of its point being passed over the vein between it and the skin. To serve as a guide, the grooved director is now inserted in the puncture of exit from which the needle has just been withdrawn, and the needle, now pushed on, meets the groove of the director and comes out at its former aperture. The subjoined diagram (Fig. 1) shows the lines of puncture, which include the vein, with some surrounding tissue. After these

FIG. 1.

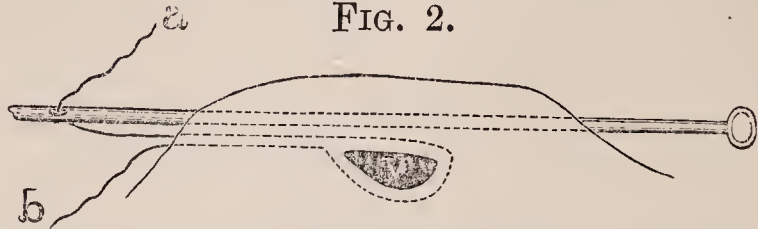


A E C F B, Track of first puncture under the vein v.
E, Point to which the needle is withdrawn. E D F, Track of puncture over the vein. F, Point at which the groove of the director at B meets the needle to conduct it out at its former channel, F B.

tracks were made, I formerly used blunt needles and a director to pass the ligature round the vein and tie it. Latterly I have used a triangular pointed needle five inches in length, with an eye in the middle and a bulbed extremity. It is thinner in the shaft than at the point, so that the ligature threaded through its centre passes without hindrance along with it into the puncture. The needle, with about eight inches of ligature, is thrust under the skin beneath the vein and brought out on the other side, as just explained. It is pushed on till the ligature appears, one end of which is then withdrawn sufficiently to allow it to be passed over the vein, guided out by the director as described,

and pushed on till the other end of the ligature can be pulled through. At this stage of the operation, the position of the vein, the ligature, and the needle is as shown in the annexed diagram (Fig. 2). The ligature now forming a loop around

FIG. 2.



d, Ligature drawn through after first transfixion under the vein *v*. *a*, Ligature carried over the vein and coming out at the same orifice as *b*.

the vein is drawn out of the needle, tied in a single knot, and that end of it which was first passed through is drawn back by the needle to the other side of the vein, and the knot passing under the skin is then tightened. To tie again and complete the reef knot, the eye of the needle bearing the ligature must again be pushed through, and the knot tied as in the first instance; the other ligature is brought back in the needle, which may now be entirely withdrawn, and the knot made fast. The ends are now cut off as near to the knot as possible; this is done by pulling gently on the one-half of the ligature, and cutting it off close to the skin, so that it at once disappears beneath it when divided; the other end is similarly dealt with. The vein is now tied with a reef knot, which with both of its ends is beneath the skin. In this proceeding it will be observed that till the completion of the operation the needle is never withdrawn entirely out of the wound; and that it is by means of the eye carrying the ligature from one side to the other that the knot can be correctly and securely tied subcutaneously. To ensure more complete and permanent adhesion, as well as to avert clotting in the vein, two ligatures must be applied, at intervals not exceeding an inch. The lower ligature to be first applied, and before tying the knot of the upper one all the blood in that part of the vein between the two points of occlusion must be pressed out, so that the sides of the vessel are brought into the closest contact. By this means a much firmer adhesion is obtained than through clotting and subsequent contraction and occlusion. Broca lays great stress upon the different results of stability of obliteration of veins, produced by coagula and by adhesion of walls. The latter mode of adhesion he asserts to be more solid even than that which takes place between the pleuræ; whereas the other is frequently but temporary. The formation of thrombus is to be prevented, in the first place, as urgently pointed out by Erichsen, by keeping the

ligature out of the vein; when from the pressure of hemorrhage, of which there should not be any, there is reason to suppose the vessel is pierced, operation on that spot must be at once stopped, and another chosen. In the second place, by firm pressure on the limb, previous to any ligaturing, by means of a rubber bandage applied from the foot up to that part immediately below the spot chosen for operation. By doing this the veins are emptied of their contents, so that no thrombus with secondary phlebitis can result. For the same reason the bandage is also to be continued over and above the ligatured portions as the operation proceeds. The application to each of the punctures of a small piece of lint moistened with carbolic oil and covered by absorbent carbolized wool completes the procedure. Unless there is much pain, the dressing need not be removed for three or four days. During this time the patient is to be kept in bed; on the fifth or sixth day, according to the amount of tenderness, the leg may be put to the ground. It is seldom that I have seen suppuration except when thick ligatures have been used or when a large portion of tissue has been included. It has never, in any case, amounted to more than two or three drops of pus, which, after making its way out of the punctures, was immediately followed by healing. As I remarked, the application of two ligatures, less than an inch apart, is the surest means to produce obliteration; in ordinary cases two, or at most three, such obliterations are sufficient to relieve ordinary varicosity. In eighteen cases of operation where the measures and precautions I have enumerated have been observed, I have seen no bad results, or, indeed, any that caused the slightest anxiety. In one instance, that of a person about fifty-five years of age, in whom the saphena was tied six inches above the knee, an acute attack of gout developed, affecting the great toe of the limb operated upon. So far as I am able to judge during two years I have adopted these methods, the results have been permanent upon the vessels ligatured. The most satisfactory cases of all, probably because the disease in the veins was in an early stage of development, were those of some young military cadets upon whom I operated. The varicosities before operation were such as would have disqualified these gentlemen for the service.

In long-standing cases where there is much œdema and great tortuosity of vessels, there are considerable difficulties to encounter. In regard to these, Mr. Duncan's paper, already referred to, gives some valuable suggestions; amongst others, to facilitate the application of the ligature, he advises that a tight rubber band be placed high up round the limb; this while it brings the veins out in strong relief, has the additional advantage of rapidly and surely showing by hemorrhage when-

ever they are wounded. He has also found that a rubber bandage well applied and kept on for some time reduces that solid brawny œdema so frequently met with in varicose disease, in which the vessels run like gutters beneath the skin and render deligation difficult.

In conclusion, I need hardly observe that the method and precautionary procedures here set forth lay no claim to originality. The method, indeed, is synthetical, composed of elements selected from such procedures of others as promise the greatest immunity from the peculiar dangers which are understood to attend operations on venous tissues. Its details may appear complicated and superfluous; but with the facts of the latter investigations of surgical pathologists before us, and the knowledge of how completely in the instance under consideration the results are dependent upon healthy inflammatory action, distinguished from that due to septic causes, there is an enhanced disposition to sacrifice expedition in method to correctness in principle, and to stoop to what may appear tedious minutiae to ensure safety.—*Lancet*, August 26, 1882, p. 307.

56.—A NEW HÆMOSTATIC AND SURGICAL DRESSING.

By EDWARD THOMPSON, Esq., M.B., Surgeon to the Tyrone County Infirmary.

Some months since, at one of the quarterly meetings of the north of Ireland branch of the British Medical Association, I directed attention to the use of the puff ball as a hæmostatic and surgical dressing. My attention was first directed to this substance by the Rev. Dr. Discon, the respected rector of the parish of Beragh, who told me that by its means the life of a poor woman, who had suffered for a long period from an open cancer of the right breast, had been preserved for years, and her sufferings much mitigated. I visited this patient, and ascertained that she had tried almost every form of surgical dressing without being in the least relieved either of her sufferings or the constant hemorrhages which weakened her. In despair she sought the aid of a country quack, who suggested the use of the puff ball, or, speaking technically, the *lycopodon giganteum*, which grows close to the roots of trees in some of our woods, and which, I believe, has gained a solid reputation amongst the country folk. From the day the patient commenced the use of this substance her sufferings were greatly mitigated, and she improved in health and strength. The frequent bleedings ceased, and the foul odour from the sore was greatly diminished; indeed, so admirably did the puff ball act, that the poor woman lived in comparative comfort for

seventeen years after the first appearance of the cancerous ulceration. But not only does the *lycoperdon giganteum* possess those important styptic properties which would be in themselves more than sufficient to commend its use to surgeons, but it is also a most soft and comfortable surgical dressing, and the powder it contains seems to possess antiseptic and anodyne properties. The puff ball is, when mature and fit for use, almost as large as a man's head; it is enclosed in a thin capsule which must be removed, it can then be torn in pieces and used either as a styptic or for applying any required surgical dressing. The puff ball undoubtedly possesses the qualities here claimed for it, and this I assert positively (although we live in an age of scepticism), both from my own experience and that of others. It is, however, its hæmostatic properties that seem to me to be so especially valuable; it has the power of stopping instantly even the most violent external hemorrhages upon which iron, matico, turpentine, &c., have exercised their properties in vain.

Mr. Fagan, the leading surgeon in Belfast, told me a very short time ago that when removing a large tumour from the neighbourhood of the orbit, he encountered the most violent hemorrhage from large arteries in the bone, which of course he could not tie, and which even pegging with pieces of wool failed to control, yet a small piece of the puff ball at once restrained all bleeding. Dr. McKeown has also used this substance, and although he denies that the puff-ball has any antiseptic or anodyne properties, he fully concurs in the opinion a number of North of Ireland surgeons have formed as to its complete success as a hæmostatic. I have thus briefly directed attention to this most useful substance, in the hope that some of our leading surgeons will use the puff-ball, and ascertain for themselves its great utility.—*Lancet*, July 29, 1882, p. 136.

57.—NÆVI OF THE FACE TREATED BY ELECTROLYSIS.

By H. H. CLUTTON, M.B., Assistant Surgeon to St. Thomas's.

A nævus on the face is always of great interest to the surgeon, for he has here to exert his ingenuity to destroy the growths, and at the same time to produce as small a scar as possible. Oftentimes mere "specks" at birth, they afterwards in a few weeks grow with great rapidity, and if not quickly destroyed or removed become a source of great disfigurement. Besides numerous instances of such growths on the less important parts of the face, such as the cheeks and forehead, where the nævus can be treated with some facility, a few cases have appeared in the out-patient room of more than ordinary interest. Such were the following:

L. P——, a female, æt. three months. A small red spot was first noticed on the extreme tip of the nose when three weeks old. This steadily increased till the nose projected like a mushroom, the tip being about the size of an adult thumb as the child cried. The whole thickness of the nose at this spot was occupied by a nævoid growth. Tying was here out of the question. The actual cautery would have done too much, destroying as it does *en masse*. There was the same objection to caustics. Excision was also impracticable, as one could not take it away without removing the whole of the extremity of the nose. Electrolysis appeared more feasible, as centres of slough might be produced by its means through the whole thickness, and from thence coagulation and contraction spread throughout the growth. This was accordingly done, from six to eight cells only being employed, so as to avoid an extensive slough. It was soon apparent that some contraction was taking place, and that it did not swell quite so prominently when the child cried as it did before. As soon as the small puncture had quite healed and the scab fallen off the process was repeated, and in three months enough had been done to make it evident that coagulation and contraction were taking place throughout the whole growth. The child was then six months old. Left alone for three months it continued to contract, till at last there was no visible swelling at all when the child cried, and the extremity of the nose felt quite hard. This treatment had proved, then, quite successful in a case in which one could not remove the whole growth. An exactly similar nævus occupying the extremity of the nose is under my care at the present time, and the same treatment is being successfully followed.

M. B., æt. six weeks. The mother had noticed a small red speck on right upper eyelid at birth, which had been rapidly increasing during the last few weeks. Nearly the whole of the right upper eyelid, both in its thickness and in its breadth, was occupied by a rapidly growing nævus. All other treatment except that of partial destruction seemed unsuitable. Total destruction would have infallibly produced ectropion of an aggravated character, as the growth, besides affecting the skin, was evidently growing luxuriantly between the skin and tarsal cartilage, and from thence backward under the frontal bone. Electrolysis was here quite successful. A few cells only (from six to ten) were used so as to avoid an external slough. The needles made to penetrate the whole thickness of the growth left behind a tunnel of destroyed tissue, from which coagulation and consolidation spread through the whole nævus. The battery had to be applied several times to small spots, which continued for some time to spring up at the margin of the

growth ; and in two months it seemed quite cured. However, some time after, when the baby was about six months old, it was brought back again with the eyelid almost as full, and swelling as before when the child cried. This was very disappointing, but a second application in the same way again procured its consolidation.

Edw. J. H—, æt. six months, was brought to the hospital with a prominent nævus at the root of the nose, completely filling up the interval between the eyes. The skin and subcutaneous tissue were both involved by the nævus, which formed a considerable tumour when the child cried. By electrolysis, using only ten cells, consolidation was effected. It became almost entirely solid after a few applications, the perforation made by the needle healing with a depressed cicatrix. Sufficient discharge only was produced to keep a small scab adherent to the surface till the small circular cicatrix had been perfected. In a few weeks the tumour had shrunk considerably, although some of the peripheral part was still spongy. The mother ceased bringing her baby to the hospital as she considered it cured. In six months it was evidently beginning again to increase, so she brought him back, and we resumed the treatment by electrolysis to the outlying parts of the growth. It soon began to shrink and was, I believe, eventually completely cured, shrinking up into a small puckered mass at the root of the nose. I have not seen the child since, but I have no doubt even this small amount of swelling has become much reduced in size. The charming part of the treatment by electrolysis is, that you can regulate the amount and extent of destruction by including a few more cells within the circuit or by reducing the number. And at the same time the action is not confined to the superficial part of the growth, but may be made to extend through the whole depth by pushing the needles or electrodes farther into its substance. Large deep-seated nævi on the extremities or trunk may be made to slough out *en masse* by a current from thirty to forty cells ; and, with the same instrument, by merely reducing the number of cells a modified action, extending through the whole nævus. may be effected, as in the cases quoted above. That there is a tendency to recurrence after such partial treatment as is here discussed there can be no doubt. But then one must here recollect that it is only recommended for such cases as these on the face, in which total destruction for various reasons is quite inadmissible. I think, too, that by keeping the case always under observation the slightest recurrence can be at once checked in its growth.—*St. Thomas's Hospital Reports*, vol. xi.. 1882, p. 49.

58.—ON A CASE OF MULTIPLE FATTY TUMOURS.

By H. H. CLUTTON, M.B., F.R.C.S., St. Thomas's Hospital.

In last year's "Hospital Reports" I related two cases in which the forearms were covered with multiple fatty tumours symmetrically disposed. Since then another patient has presented himself with his body covered in a similar manner. During the present year, 1880, there have also been several cases recorded in the "Brit. Med. Journal," by three different observers. In each of these cases the tumours were remarkable for their symmetrical arrangement, and in occupying the limbs rather than the trunk. The forearm and thighs were the parts affected, and, separately examined, the growths presented the ordinary characters of fatty tumours.

In the cases reported by me last year the tumours were of small size and symmetrically placed upon the forearms. They had been suddenly observed, and did not subsequently increase in size or number. The present case is a still more extraordinary one than either of the preceding.

Wm. S—, æt. 44, waiter, had noticed lumps behind his head for about five weeks before he came to the out-patient room of St. Thomas's Hospital. He thought that they had been increasing slightly since first noticed. He did not know that he had any others. On examination he found that he had the most remarkable development of fatty tumours, all placed with the most accurate regard for symmetry on both sides of the median line of the body. At the back of his head, occupying nearly the whole of the occipital region, were two large fatty tumours, one on each side of the ligamentum nuchæ, stretching upwards on to the scalp, as far as the superior curved lines of the occipital bone, and forward as far as the attachment of the sterno-mastoid muscle to the mastoid process. Equal in size, symmetrical in position, similar in all their characters to one another they presented a most quaint appearance. A little lower down but quite separate from the above were two others, one on each side of the spinous process of the seventh cervical vertebra. These were quite distinct from one another, and placed in identically the same position on each side of the spine. These four tumours together formed a splendid likeness of the corpora quadrigemina, with a median and transverse groove separating them from one another. Beneath the jaw on each side were other similar growths, forming an almost complete collar of fat round the neck, but each development of fat was distinctly a growth which could be separated from the surrounding tissues, and presumably therefore provided with a distinct capsule.

Other fatty tumours were sprinkled all over the back, occupying pretty nearly the same positions on each side of the body, but not quite so symmetrical as the above; they varied in size from an orange to a small nut. In the lumbar region there was one large one on each side. On the abdomen he had also a very curious symmetrical arrangement of similar growths. Immediately below the umbilicus, on each side of the median line, were two rather prominent fatty tumours, soft, and rather more diffused than is ordinarily the case, but yet sufficiently isolated to make one feel sure that a capsule would be found if the growth were removed. Above the umbilicus were two other growths, similarly situated, but not quite so distinctly separable from the surrounding tissues as the others, forming, as it were, a transition between the ordinary constitutional development of fat and a fatty tumour. At each flexure of the elbow was a small lobulated growth, but, with this exception, there were none to be discovered on the extremities. The patient came under Mr. Croft's care in the hospital, and had both occipital tumours removed. They proved to be ordinary lipomata.

Multiple fatty tumours are, I am sure, not so uncommon as they are ordinarily supposed to be. I would submit that when they do occur they have a more or less symmetrical arrangement, not quite so accurately placed perhaps as in the case here recorded, but still equally occupying the two halves of the body. If the limbs are occupied by such growths, it will be the same portion of the body that is affected on the two sides, *e.g.* both forearms. If the trunk is the part involved, there will be an almost equal number on each half. I have observed similar cases in the practice of other surgeons, and have come to the above conclusion. It is difficult to give any explanation for this symmetrical disposition, except that of constitutional diathesis. They generally appear at a time of life when fat is developed largely upon the surface of the body. A solitary fatty tumour looks like an accidental occurrence, but when the same growths appear in large numbers in the middle period of life, they seem to be a development of fat in a slightly aberrant form; the fat is encapsuled instead of being diffused over the surface of the body.—*St. Thomas's Hospital Reports*, vol. xi., 1882, p. 54.

59.—ON ECZEMA AND ITS TREATMENT.

By Dr. HENRY KENNEDY, A.B., Physician to Simpson's Hospital and the Whitworth, Drumcondra, Dublin.

I hold with those who look upon eczema as being essentially a constitutional affection. In other words, it is a wrong view to consider it as a disease of the skin. Nor is this a point of

little moment. For if it be not held, and, what is of much more importance, acted on, grave consequences may ensue to the patient—to say nothing of the obstinacy which the disease will assuredly offer to anything of what is understood as local treatment. For myself I believe many cases occur where the cure of the disease must be conducted with considerable caution; inasmuch as serious consequences may ensue if the disease be cured too quickly. The longer the disease has existed the more caution is, I think, needed. I have known parties whose general health suffered in exact proportion to the amount of eczema present—that is, when the rash was out they spoke of feeling well, and *vice versa* when the rash disappeared; as they were sure to feel indisposed in one way or another. In fact the disease, in some constitutions at least, acts as a safety valve; and of course the more extended the disease is, the greater danger would arise from its going inwards. At the present moment I have a patient in the Whitworth Hospital, Drumcondra, who was sent in by Dr. Nedley. She had a severe attack of eczema of one leg, and of the acute character, attended with great heat and itching. She is a woman above sixty years of age. After being a week under treatment the disease attacked both ears sharply; but this did not cause me to alter the treatment, and by the end of three weeks she might be said to be well. This was a much quicker cure than it has usually been my lot to effect. She was scarcely well, however, till she began to complain of her breathing, and I then learned that for some time previous to the attack of eczema she had felt her breathing oppressed; yet she had never mentioned this whilst under treatment, but only now that the eczema had been cured, and, as already stated, rather rapidly so. On examination of her chest I was not able to detect anything abnormal in either the heart or lungs. The former beat feebly, but she did not allow to her breathing being hurried on exertion. She had no cough. The urine was higher coloured than that of health, and I now prescribed for that symptom. She left hospital, however, before this treatment could have effected any change, and she complained still of her breathing. I have not heard of her since. This patient had been in the habit of drinking porter daily.

There can be no doubt, I think, that in this instance there was a distinct alternation between the eczema and the dyspnoea. In fact, the rash acts as an outlet to the system, and in a good many instances too; but in some in a very much more marked way than others. If time allowed I could adduce other instances of a similar character.

At times the disease, or rather the healing of it, leads to a different result, and parties after being freed from the eczema

grow fat. It is more than probable that this was what took place in the case of the first Napoleon; for we read he had suffered, and for a considerable time, from some skin affection, and that when it was healed he at once began to get fat.

Of the close connexion between the gouty poison and eczema there can be no doubt. All writers on the subject speak of it, and I only allude to it here for the purpose of stating that the idea should ever be kept in our minds; for I need not observe that gout, in its developed form, is comparatively a rare disease amongst us; whereas the gouty diathesis is very common, and it is in connexion with it that eczema makes its appearance. The successful treatment of many cases of the disease turns, I repeat, on our keeping steadily before us the possibility or, I should rather say, the frequent occurrence together of these two states. It need scarcely be added that it is to eczema occurring in middle or after life that these remarks mainly apply.

Of the sequelæ of the disease there are two which seem to me worthy of a moment's notice; the more so as I am not aware of their being described in any of the standard works. The first is that when an attack of eczema is about to get well it may do so by another affection taking, as it were, its place. This other affection is pemphigus, which I have seen show itself when the eczema was steadily waning, and on the same portions of the body. This state, it is well known, is attended with much less suffering than when eczema is present. It is to be noted that the appearance of pemphigus has seemed to me to call for a change, or at least some modification, of the treatment, which had, till that period, been adopted.

The second point which I would notice, and which I have ventured to call a sequela, is the occurrence of hemorrhage, most generally from the nose. Not that this occurs when the eczema is present, but when it has very much declined, or has possibly been cured. Under these circumstances epistaxis, and of a very severe kind, may arise. Possibly I address some who have met such cases. As far as I myself have seen, the hemorrhages occur in parties who are inclined to be fat, and who at some former period had suffered from eczema. The state known as plethora is often well marked in these cases; but though the loss of blood may run them to death's door I have not seen any case which proved directly fatal. Of course the connexion between the bleedings and the eczema is open to question. Still the point seems to me worthy of notice.

Of even a sketch of the general treatment of eczema I cannot speak here. Such would far exceed my present limits, as well as strain your forbearance. I may say, however, it seems to me that the treatment of the disease has undergone a great

improvement within the last few years, and that in the great majority of cases a complete cure can be confidently expected. We have clearer views of the causes of the disease, and what it is we have to correct and conquer; and I think it may be said with certainty that the results are far in advance of what was attained a quarter of a century since.

Before concluding these desultory remarks there is a single symptom to which I would ask attention; more, I confess, with the hope I may get some hints for its relief, than that I can give any help myself. I speak of the itching which constitutes such a prominent symptom of the disease. All I address are aware of the suffering it entails; and I have often heard parties say that uncomplicated pain was much easier borne than itching. I have sometimes wondered whether any particular nerves were implicated; for it is certain that pain often exists without itching, and itching without pain. Itching, too, may exist, as all know, without any rash, eczematous or otherwise. Of this I saw a very aggravated instance about a year since. The patient was a fine old lady much above seventy years of age, who, after what was a doubtful attack of gallstones, began to complain of itching of the surface, which in the course of two or three days spread over the whole frame. I really thought the patient would have died from the irritation alone, caused by the intense itching, which gave her no rest day or night—being, however, much worse at night. The reason, however, why I speak of this case is, that though the patient seemed to tear the skin, no rash was visible, even when examined by a magnifying glass. I will not take on me to assert that the treatment used in this case was successful. The attack, which lasted more than a fortnight, seemed rather to wear itself out. I may state that Dr. Little saw the patient with me.

There is one point, whilst speaking of the means for relieving itching, worthy of note. The very same remedies which afford relief in one case will fail in another, though apparently identical; and this it is, I apprehend, which renders the treatment uncertain. In the more violent forms of itching, and particularly if it be at all what is understood as an acute attack, nothing has seemed to myself to afford more relief than the application of what may be called wet heat. We know, as a matter of experience, that the heat of the bed aggravates much the sense of itching; but it is otherwise with warm water, which rarely fails to give, at least, temporary relief. All I address are, I am sure, aware of this, and though each person has their own special remedy to add to the hot water, I believe the relief arises essentially from the water, which it is best to apply as hot as the hand and the patient can bear. It is in the

worst forms of itching that the remedy is of the most marked use; for when the case is of a more chronic character other remedies come into play. Into these, however, it is not my intention to enter here.

DR. CAMERON said a preparation which in a great many instances had mitigated, and in some had removed the itching was sweet milk combined with liquor plumbi subacetatis—one ounce of the solution to four ounces of milk. Milk thus combined with sugar of lead would keep perfectly sweet for two or three years. He agreed with what Drs. Kennedy and Quinlan had stated as to the comfort given by warm water. He once had an attack of eczema himself, being of a gouty diathesis; and after trying several local and constitutional remedies, he found that nothing but persistent bathing every night in water, as hot as he could bear, did any good. He had for four years a patch about the size of the palm of his hand on his left leg near the heel. He made an arrangement for keeping up a continuous application of the hot water for two or three hours at night; and then before going to bed he applied the milk and acetate of lead solution. In the course of a week the effect was marvellous. The scales disappeared; the skin began gradually to assume its normal appearance; and by perseverance in the treatment the scaly patch of eczema disappeared in the course of a month.

DR. J. W. MOORE said that great relief is sometimes obtained from the use of a weak solution of carbolic acid.—*Dublin Journal of Medical Science*, June 1882, p. 528.

60.—ON THE TREATMENT OF ECZEMA BY DIET.

By A. CRESSWELL RICH, Esq., M.B.Lond., Liverpool.

The treatment of eczema by a Banting's diet, as recommended by Mr. Balmanno Squire in the *Journal* for April 8th, is by no means a new departure in the dietetic treatment of skin-disease. The plan has been in use here for several years. The extraordinarily rapid way in which cases of the most chronic kind recover by careful dieting on Banting's principle is very remarkable. The following is an example.

Richard O., aged 9, had suffered from general eczema ever since he was five months old. For this he had been under constant medical treatment, without any permanent good being effected. He came to the hospital on March 6th, where he has since regularly attended as a patient of Mr. Walker. He was ordered the rigid diet. After a fortnight's careful adherence to the diet ordered, an appreciable improvement was noted; in a month, he was rapidly improving, and now he is almost well. The only other treatment was an ointment of pitch and vaseline.

I could adduce other examples from private, as well as from hospital, practice. I have chosen the above, as it appeared to be an unusually hopeless case of chronic skin-disease. The best results of Bantingism are, no doubt, seen in lymphatic infants; but it is also applicable to the chronic eczema, local or general, of adults. Mr. Squire would apparently restrict the employment of this diet to eczema. As a matter of fact, the Banting diet is of great value in other skin-disorders, especially in the chronic skin-affections of stout free-living patients about fifty years of age.

As to the use of cod-liver oil, I am not disposed to concede that in every case this most valuable medicine and food-stuff must be excluded. In sallow phlegmatic children, provided the digestive powers be fairly good, I believe the oil, used in small doses, to be of the highest importance. It is well known that cod-liver oil aids digestion where it can be tolerated, and it is usually granted that it acts in this way by aiding the conversion of nitrogenous food. In some children, if all fatty material be forbidden, the digestion ultimately suffers, and the little patient becomes troubled with irregularity of the bowels, and also coldness of the feet and hands, with a tendency towards catarrhal affections of the respiratory tract. In these instances, a little cod-liver oil, while not supplying too much fat, yet provides enough for purposes of digestion and proper maintenance of the heat of the body. Clinically, it is found that the oil answers best when given after the diet has been rigidly adhered to for at least three weeks or a month; that is, when the system begins to feel the deprivation of fatty materials. The presence of any of the symptoms or signs of lithæmia would, of course, at once negative the use of cod-liver oil.

I have now so frequently noticed improvement in cases of various kinds, not only skin-diseases, by the omission of milk and an excess of saccharine and starchy food from the diet, that I venture to think that "Bantingism" is not sufficiently made use of in these days.—*British Medical Journal*, May 13, 1882, p. 695.

61.—ON ULCERS AND ECZEMA OF THE LOWER LIMBS.

By W. ALLAN JAMIESON, M.D., F.R.C.P., Edinburgh.

The main thing in these cases is a deficiency in that constant elastic tonic support to the vessels which should exist in a healthy limb. This gives the key to all successful treatment, but the exact mode in which it is to be carried out is by no means identical in all cases. We must take into consideration not only the ulcer itself, but the individual. In some cases it

may be a tolerably easy matter for the sufferer to lay up in bed or on the sofa for a few weeks till the loss of tissue is repaired. In general this would involve, in the class of persons in whom those ulcers are most frequent, a serious pecuniary loss. In these, then, we must endeavour to replace artificially the defective natural support to the vessels. First of all, any acute inflammatory complication must be allayed by rest in the horizontal position. This is imperative. Combined with rest, starch poultices give most relief. These should be made of Glenfield starch, prepared as for starching linen; allowed to cool, when it sets into a transparent jelly. This is thickly spread on a piece of rather thickish old cotton of a suitable size, covered with muslin, and the inflamed part enveloped in it. This forms a delightfully cool and soothing application, which retains its moisture for a considerable time, but should be renewed ere it becomes hard. Never apply a starch poultice hot. Always allow the starch to set before using it. Another plan, and an excellent one when the discharges have become foetid, is to dress for some days with boric lint and lotion, which soon renders the part sweet and the discharges inodorous.

Two plans are now open to us, and sometimes one, sometimes the other, suits best. In most cases strapping with bands of adhesive plaster *cut lengthwise*, so that the plaster will not stretch, answers best. This plan of treatment seems to me to have fallen, in these days of antiseptics, undeservedly into disuse. I had, many years ago, an opportunity of seeing an immense number, some hundreds, of ulcers of the leg, in the workhouse at Preston, in Lancashire. All were treated, and most satisfactorily, on this plan. The strips must be smoothly applied from below upwards, and directly to the ulcerated surface. The lower edge of the lowest strip should be snipped in one or two places, so as to prevent its cutting the skin. The strips are to be changed, at least till the discharge very much diminishes in amount, every day. Over the plaster, from the toes to the knee, a roller bandage is carefully applied. The best bandage is the so-called *water-dressing bandage*, open wove cotton, with *torn* edges. Sometimes a domette flannel answers better. The bandage should be secured with a safety-pin, not tied, below the knee. These seem trivial details, but success depends on attention to minutiae. It is quite wonderful the relief afforded by this treatment, while it enables the patient to move freely about. The other mode is to envelop the legs in Martin's solid rubber bandages, and when the skin will stand this without blistering, the results are excellent. Some persons, however, cannot bear the heat the bandage causes. Use always the *genuine* ones. Dr. Martin says that the rubber employed must be thoroughly "cured," and the bandage prepared with a minimum of

sulphur—directions which do not seem to be followed out by the makers here. His are now made thinner than at first, and these thin ones answer well if no great strain is to be put on them; but the stronger and thicker ones will be found, in cases of extensive ulcer, the best, most serviceable, and the cheapest in the end. The bandage must be put on before rising from bed in the morning, ere the limb swells; removed, and the ulcer dressed with some boracic lotion, gutta-percha, and roller at night. This is generally better than an ointment, as oily matters rot the bandage, and patients are apt to be careless in wiping off the salve before applying the bandage in the morning. The boracic acid has the advantage of keeping the sore sweet; for when the rubber bandage is taken off, the pent-up secretions of the limb and ulcer too often are most offensive. The leg should be bathed with tepid water at night, and gently dried before being dressed, and the bandage itself rinsed through warmish water and hung up to dry on a line or towel-rail. The bandage replaces most admirably the elastic support of the skin which had become defective, and, indeed, in time in a great measure restores this, provided the state of the general health, the condition of the bowels and kidneys especially, be attended to, and any error in occupation remedied as completely as possible.

Turning our attention now to eczema as affecting the lower limbs, we find that it occurs either as part of a general outbreak, which involves more or less extensively the whole body, in which case the extremities very commonly suffer most; or the disease is local, and is chiefly limited to the space between the ankle and knee, sometimes, though more rarely, stretching over the foot. There are few forms of eczema which cause more annoyance to the sufferer than those which implicate the arms and legs. When eczema of the leg is slight and superficial, the severe itching, vexatious enough during the day, but so much aggravated at night as to interfere with if not entirely preclude sleep, leads directly to mental and bodily exhaustion. When more deeply affecting the skin, the disease may quite prevent locomotion, and confine to the house, if not to bed. And yet eczema in this locality can be more satisfactorily treated than in almost any other, the very causes which lead to its production enabling us the more readily to cope with it. These causes are much the same, as far as mechanical influences are at work, as in ulcer of the leg; but there is a something more. This is that peculiar state of body, that constitutional dyscrasia, which, for want of a better term, we must in the meanwhile call the “eczematous diathesis,” a condition of defective nutrition which predisposes to the occurrence of catarrhal inflammation. In this condition we have frequently

anæmia, yet not always, for some eczematously disposed persons are plethoric and ruddy. Granting this, there is one feature common to very many cases of eczema; and this, which has often attracted my attention, is specially insisted on by Bulkley in his admirable treatise on the management of eczema, which I cannot too strongly recommend for your study. This is a deficiency in subcutaneous fat. The skin of the sufferers from eczema is often dry and lax, indicating both a deficiency in the proper action of the sebaceous glands and absorption of the subcutaneous adipose tissue which pads and gives plumpness. Some individuals are naturally slender, some are scraggy and yet healthy; but a steady diminution in the oiliness and tension of the skin at an age when senile changes have not taken place is ominous of eczema in the future. Knowing this, we may sometimes ward off the impending danger by augmenting the fatty elements of dietary, and favouring their due assimilation by the administration of lactopeptine and of pancreatine, while we at the same time replace as far as possible the deficient lubricity of the surface by such emollients as dilute glycerine and vaseline. I am sure, were this pre-eczematous stage recognised and treated, the actual disease might in many cases be altogether prevented.

There is, however, in all cases of eczema lowered vitality, due to many enervating causes, whether these be deficiency of food, or overloading of the stomach, worry, anxiety, or over-fatigue, deficiency of light and air, or inactivity and indolence. This state of health has, in general, been gradually acquired, and not seldom a danger-signal, in the shape of limited, often transient, outbreaks of eczema, might have given, if noticed, warning in time. Very frequently a patch of eczema is developed in the first instance in the ham, or it may be just on the inside of the knee, over the head of the tibia, or on the shin—all situations where the earliest evidences of varices are to be met with. This is treated commonly with zinc ointment, and may for a time disappear or be kept in check; but unless the constitutional vice be discovered and remedied, or, owing to some changes in the habits, surroundings, or circumstances of the patient having taken place, has spontaneously disappeared, further and more extensive mischief is apt to arise. The lower limbs are much exposed to changes of temperature, and their vitality is correspondingly reduced. Those affected with eczema of the legs very generally complain of cold feet and a general languor of the circulation. The cell and gland structures in the skin of the legs are less actively renewed, effete material tends to accumulate, and, like all worn-out tissue, more readily breaks down. All examples of eczema of the leg which have lasted for some time are accompanied by

more or less pigmentation. This is due partly to transudation of the colouring matter of the blood as a sequence of the slowness of the current, partly to the continued irritation of the skin, the result of scratching which has been indulged in to relieve the itching. We cannot regard this increased deposit of pigment as altogether an evil, though disfiguring. Up to a certain point browning or bronzing renders the skin less sensitive, as happens to the faces of those exposed to the sun and weather. It is, in fact, one of those protective efforts of nature of which we see so many examples. The darker hue seems to veil the vessels and nerves, and thus shield them in some degree from the irritating agent, be this light or heat, and perhaps we may add, mechanical violence too.—*Edinburgh Medical Journal*, June, 1882, p. 1059.

62.—CHRONIC RINGWORM OF THE SCALP: A NEW METHOD OF EPILATING THE DISEASED HAIRS.

By MALCOLM MORRIS, Esq., F.R.C.S.Ed., Lecturer on Skin Diseases at St. Mary's Hospital Medical School.

That chronic ringworm of the scalp is a difficult disease to cure, every practitioner will admit. There are two propositions, as regards treatment, which I desire to bring under the notice of the profession. But, first, I must briefly refer to the factor in the problem we are called upon to consider—a fungus growing on and in the hairs, extending deeply into the follicles as far as the roots.

In a paper published in the early part of last year, I pointed out that two things were essential in the treatment of this disease: first, some drug which is capable of destroying the fungus, and so preventing its further development; and, secondly, some vehicle to carry this drug to the part of the follicle where the fungus exists and grows. Arguing, from analogy, that certain chemical substances, called antiseptics, had the power of destroying certain low forms of vegetable life, such as bacilli, micrococci, and bacteria, I suggested that thymol or menthol should be used as the parasiticide, and that chloroform would answer the purpose as the absorbent. But, as the latter was volatile, I added oil to the compound to prevent evaporation. While trying this liniment, of thymol, chloroform, and oil, in a large number of cases, I was struck with the fact that in some of them, in spite of the constant application of the remedy, the disease appeared on other parts of the body, and also on other parts of the head previously free. It seemed difficult to understand that, in a strictly antiseptic medium, spores could be carried from part to part and live; but such seemed to be the case, for

in some instances, when the liniment had been used too freely, and had run down the neck, fresh spots of the disease showed themselves in that region. During the time I was considering this difficulty, I found that Koch, in Berlin, had been making experiments on bacillus spores with various antiseptics, and found that these spores lived and developed even after being placed in carbolic oil (one part in twenty) for one hundred and ten days. This, I think, is a very strong argument that neither oil nor fat of any kind should be used when the full action of an antiseptic is required.

Of course I am fully aware that all the best authorities recommend strong ointments, mercurial or otherwise, though for a very different reason from that I have been describing. They care little or nothing about the antiseptic action, so long as inflammation of the follicle, more or less severe, be produced. The spores are said not to live in inflammatory products ('Thin). But surely cases are not uncommon in which the disease is transplanted to healthy parts by means of the discharge. I have seen a case in which croton-oil was used to a single patch, and in a short time the head was covered with small centres of infection. In this case the spores were carried in the discharge.

And, again, have not all the old chronic cases we see in practice—some of them of four or five years' duration—been cases treated by constant attacks of inflammation, and yet with the result that spores have been found with ease? My view is that to produce inflammation of a slight kind is useless; and that a severe kind is unjustifiable, on account of the risk of destroying the follicles altogether, and producing baldness.

To return to the question of fats: if fat of any kind from without protects the spores, as Koch assert, the natural fat or sebaceous matter must have a similar effect. For this reason, I have tried to remove the fat by means of ether, and have abstained from using ointments or oil in the treatment. I wash, or more strictly dab, the patch each morning with ether, rectified spirits of wine, and thymol, in the following proportions: ether, five drachms; rectified spirits of wine, two drachms and a half; and thymol, half a drachm—applying during the day glycerine with a very small trace of perchloride of mercury. Petroleum may be used in the place of the ether and spirit. One drachm and a half of petroleum-oil takes up five grains of thymol. The ether or petroleum is of greater value than would at first sight appear, and for the following reason. There is a disease of the scalp known as *seborrhoea sicca*, the chief characteristic of which is the falling out of the hair. This is caused by the absence of the natural fat in the sebaceous matter. It is cured by stimulating the glands to action, and by adding fat artificially. In the ringworm patch,

we want the diseased hairs to fall out; and, by producing a condition similar to seborrhœa sicca—that is, by making the part very dry—we can actually produce this effect. Instead, therefore, of epilating by means of forceps—which is useless, as the hair breaks at the neck of the follicle, leaving the diseased part behind—we can epilate by dissolving the fat, and thus loosening the hair. In this way, we can in a few days remove all the broken and diseased hairs.—*British Medical Journal*, June 17, 1882, p. 901.

ORGANS OF URINE AND GENERATION.

63.—NEW MODE OF DETECTING STONE IN THE BLADDER.
THE AUDITORY METHOD.

By JAMES MCKENZIE DAVIDSON, Esq., Student of Medicine,
Aberdeen University.

It occurred to me lately that the ordinary sounds for stone in the bladder might be greatly improved by the following very simple plan—viz., connecting the end of the instrument with the ear of the operator by some suitable sound-conducting substance:

Some rough experiments on my study table with a silver catheter and thread and wire were so far satisfactory, but the results with a small piece of indiarubber tubing were still more encouraging. One end of this tubing (bore one-eighth of an inch in diameter) was attached to the catheter, and the other was placed in the ear. By this means very small fragments could be distinctly heard when touched by the end of the catheter—even when the catheter was grasped so as to imitate the hold of the urethra. I showed this to Dr. Alex. Ogston of Aberdeen, and he kindly consented to try this plan whenever I should have instruments made to carry out my idea. Unfortunately illness has prevented him doing so. I had one sound made of solid steel and another of gun-metal, but hollow. From the handle of each there was a small projection, to which the indiarubber tube could be easily attached. Through the kindness of Dr. Rodger of Aberdeen I had the opportunity of trying these instruments on a body at a post-mortem examination. To test them, calculi of various sizes were introduced into the bladder. The sound having been passed the bladder was explored, and the results noted before and after the tubing was attached. In each trial the result was notably better when connexion with the ear was established, even when the indiarubber tubing employed was only one-eighth of an inch diameter of bore. But a wider tubing gave by far the best results. A light indiarubber tube two feet long

and with a bore three-eighths of an inch in diameter was employed. One end of this tube was slipped over the handle of the sound, and the other end, held closely to one ear. No practical difficulty was experienced in exploring the bladder, for the tube was very pliable, and it was easy to avoid extraneous noises such as might be produced by the connecting-tube running against the operator's sleeve, &c. Anyone having a piece of tubing such as I have described can readily attach it to the handle of a sound, and in this way test the truth of my statements.

A small phosphatic calculus was introduced through a small opening made at the top of the bladder, and when nothing could be felt or heard by the sound alone (although the abdominal wall was open), yet by means of the tube to the ear the calculus was distinctly and unmistakably heard. With a large stone the "click" was greatly intensified when heard through the tube. What is very striking is the fact that the gentlest contact of the sound with the stone is readily heard. Lastly, after seeing the bladder was clear of everything but a fair quantity of water, I crushed a small piece of coal to coarse powder (as we had no débris of a calculus at hand) and put it into the bladder. The ordinary method revealed nothing, but through the tube a rough grating sound was distinctly heard. The solid steel sound gave better results than the hollow gun-metal one.

The above experiments have led me to devise an instrument which Mr. Gardner of Edinburgh is making, and which I trust will be as satisfactory as the rough method above described. This instrument or any such instrument may be termed, as a friend has suggested, a lithophone.

This method of exploration of the bladder may yield important practical results. Not only may (1) a small calculus be detected which would be otherwise overlooked, but (2) it may be that practice will enable the operator to distinguish the size and character of the surface of a calculus readily; and (3) it also appears likely that a somewhat similar ear-connexion with a lithotrite will enable the operator to find and secure small fragments more readily, and so crush them.

Dr. Mackinnon (house physician) and Dr. Sinclair (house surgeon) of the Aberdeen Royal Infirmary were present at the experiments on the body, and corroborate the results I have mentioned; and by the advice of Professor Struthers I am encouraged to make my experiments public.

Since the above was written, Drs. Mackinnon and Sinclair inform me that they have found a calculus readily by this method in a case in which the ordinary means failed to detect its presence.—*Lancet*, July 1, 1882, p. 1071.

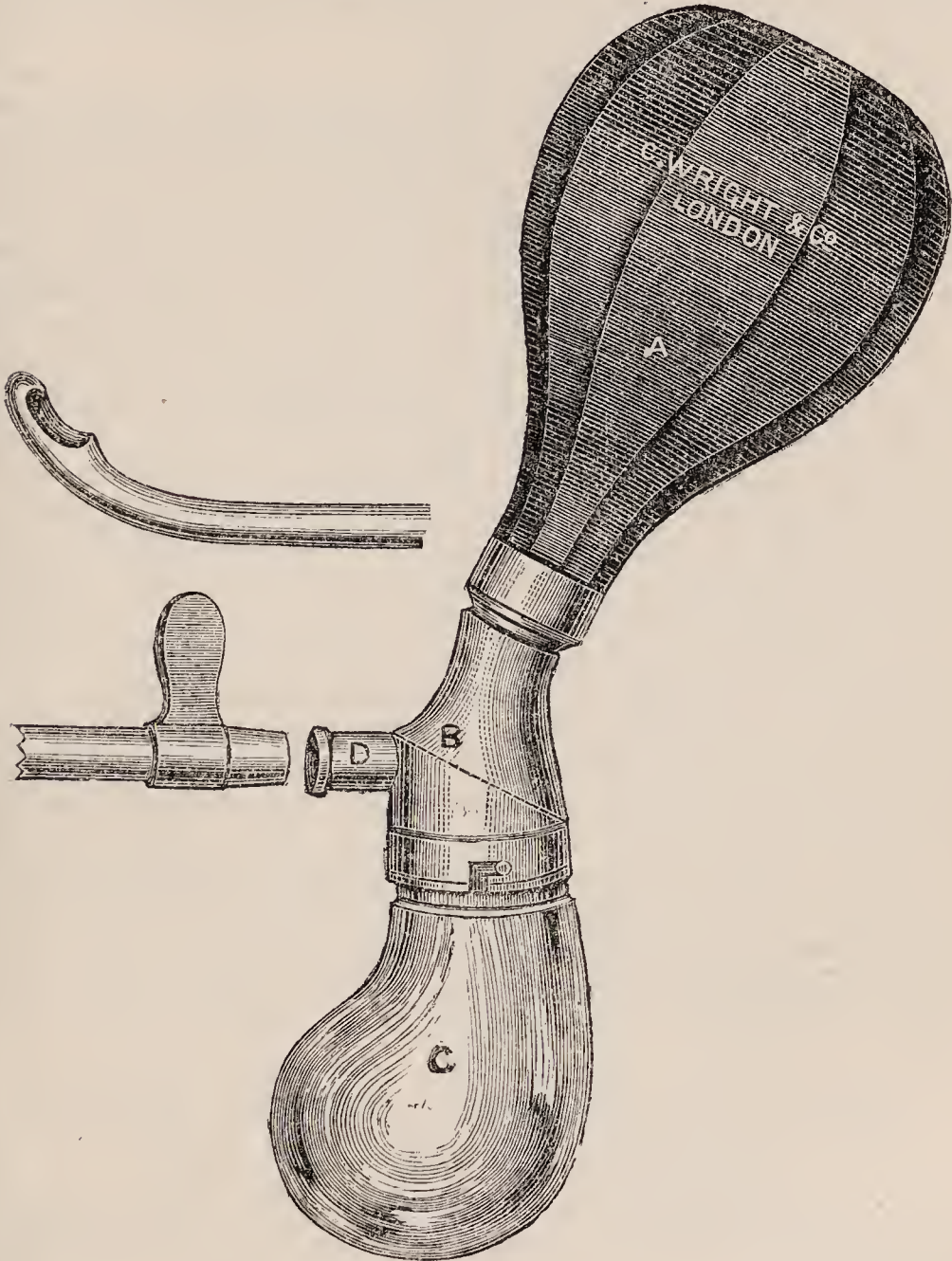
64.—AN EVACUATOR FOR THE BLADDER.

By JOHN H. MORGAN, Esq., F.R.C.S., Charing Cross Hospital.

In a lecture published in the number of *The Lancet* for January 7th, 1882, Sir Henry Thompson describes an aspirator which had been made according to his own design, and another modification of the same principle, carried out by Messrs. Weiss and Sons, and he lays down some points as essential in the construction of an efficient instrument. The first of these principles is that "it should be light and small, so as to be easily grasped and governed by one hand"; the second requires that there should be a tap at the top for the exit of air and the introduction of water. To fulfil these conditions is not an easy matter, since any apparatus of india-rubber which is to support above a heavy tap and be attached below to a cylindrical glass receiver in which fragments are caught, and to which a catheter is attached, must be of such density and size as to be with difficulty grasped, much less compressed by a single hand, at all events many times in succession. In other words, if the continuity of the bulb is broken at two points, its resiliency must be supplied by greater thickness. This objection is practically found in the case of both these instruments. At the late meeting of the Medical Congress in London, Professor Bigelow explained that "the new and essential part of the evacuating apparatus is the large catheter, whether straight or curved," and went on to describe the various apparatus which he has contrived to extract fragments from the bladder, and at the same time to prevent the possibility of their return. These instruments were figured and described in the *Transactions*, but that Professor Bigelow is hardly yet satisfied is shown by the fact that at a recent meeting of the New York Academy of Medicine he exhibited the evacuator which he has "finally settled down upon as being the best," adding that the ball-valve and strainer which formed part of his former instrument were a "little complicated" and "apt to clog."

Adhering to the principles laid down by these two eminent lithotritists, I have been at some pains to contrive an apparatus which should at once be effective in action, but of simpler construction than those hitherto invented. The result of my efforts is an instrument which is figured below. It consists of an india-rubber bulb (A) of moderate resiliency, and capable of containing about twelve ounces of water. This is of the shape of an inverted pear, and its narrow portion is fixed to a metal ring, which can be attached to or removed from the central portion of the apparatus by means of a screw. This is only required for convenience of carriage or for the purpose of cleaning the apparatus. In order to allow a better view of the

glass-receiver, the bulb is attached at an angle slanting backwards to the rest of the apparatus, which hangs perpendicularly. The central portion is of metal, and forms one with the bulb above, and is attached by a bayonet-joint to the glass receiver below. In front projects a short tube (D), into which the catheter—the largest of Bigelow's sizes—fits when the instru-



ment is in use, but which can accommodate catheters of a smaller calibre. Running diagonally downwards in the interior of this portion of the apparatus, and fixed above, just at the entrance of the passage of the tube (D), is a perforated metal disc, which is placed in such a position that anything carried

through the tube (D) must directly impinge upon it, and be thrown downwards. The glass-receiver (C) is made to fit closely to the central portion, and is shaped like the handle of a pistol, with two objects—partly because by this curve an interruption is made of any current of water carrying with it fragments of detritus, and partly because in the forepart of this transparent bowl the size and quantity of the fragments can be seen and estimated by the operator.

In order to fill the apparatus, the receiver (C) must be detached and filled, and the air driven out of the upper portion under water. The two pieces being filled, must be fixed under water, which can be done in a large basin or bucket, and for security the forefinger should be placed over the mouth of the tube (D), to prevent the escape of any water, although if the instrument is held by the solid portion and inclined slightly backwards, the pressure of the atmosphere is sufficient for this purpose. The india-rubber bulb must not, of course, be touched until the tube (D) has been adjusted to the catheter. It will then be found that the weight of the upper and lower portions is so evenly balanced (when full) as to make all manipulation easy, and entirely under the control of one hand, so that water can be injected into the bladder and withdrawn as rapidly or slowly as is wished, and the position and direction of the catheter altered.

In using this, and all other instruments for a similar purpose, it is well, after forcing water into the bladder, to pause for a second or two before relaxing the pressure on the bulb. By so doing the fragments which have been set in commotion can settle at the bottom of the bladder, and thus come nearer the eye of the catheter, and are withdrawn by the returning current of water. In this apparatus the fragments striking against the metal disc are at once thrown down into the glass receiver, where they remain undisturbed in any position of the instrument. The apparatus has already been used and approved by several London surgeons.—*Lancet*, Sept. 2, 1882, p. 349.

65.—ON A NEW KIND OF URETHRAL SYRINGE.

By BALMANNO SQUIRE, M.B., Lond.

In occupying myself with an attempt to design a model syringe, it appeared to me that the conditions to be aimed at were these:—

That it should be capable of being held, and at the same time conveniently worked, with one hand.

That it should have full “working capacity.”

That it should work easily and without hitch.

That it should be impossible for it to get out of order, and equally impossible for it to break.

That there should be no liability of the nozzle to become accidentally tilted or jerked, or pressed upon or displaced, during the use of the syringe.

That it should be impossible for the syringe to send any injection into the bladder, or equally any air into the urethra.

That it should be very portable—that is to say, of small size and flat shape, going easily into the waistcoat pocket if possible.

That it should be capable of carrying in a safe manner a supply of liquid enough for one injection.

Now, all of these conditions are fulfilled in the device I have contrived. The syringe consists of an india-rubber body, from one end of which proceeds an india-rubber tube, terminated by a glass nozzle. The body is of an elliptical form with flattened sides.

The two flattened sides of the body are each of them absolutely rigid, this rigidity being attained by the interposition of a thin but stiff iron plate in the substance of the rubber. The circumferential wall of the body which unites the two flattened sides to one another is wholly elastic, being composed only of rubber, and it has a slight outward bulge, so that when the rigid sides are compressed together, it yields, bulging outwards in all directions, and thus permits the rigid sides to be brought into complete contact with one another when compressed. The rubber of this circumferential wall is, however, sufficiently thick to be resilient, so that when pressure is released the syringe springs back accurately to its proper shape and capacity. In order to fulfil this requirement duly I find that it is necessary that the circumferential rubber wall should be two millimetres in thickness.

Now, when the rigid sides are pressed together so as to touch one another, and the nozzle dipped in water, then, on releasing the pressure, only a definite and constant quantity of water is immediately sucked up. Again, on gradually compressing the syringe till its flat sides touch one another again, this exact quantity is accurately expelled, but with it no air-bubbles. The capacity of the syringe is arranged so that this quantity is precisely that which is necessary to distend fully, but not unduly, the male urethra with fluid; and thus no injection passes into the bladder, the requisite quantity of liquid for the purpose being, as I find, one fluid drachm and a half.

The nozzle is provided with an india-rubber cap, which takes off and on, so that the syringe, filled with a supply of solution, may be carried safely in the waistcoat pocket.

The oblong shape of the body has been chosen in preference to a circular or disc shape, partly for convenience of form, but

chiefly for another reason—namely, as permitting both the fore and middle finger-tips to compress it on the one side, while the thumb-tip rests on the centre of the other side, hence, the rigid sides, when compressed, are steadily brought into complete contact with one another at every point.

It might be asked, Why is not the nozzle inserted directly into the body of the syringe? and, What is the use of the rubber tube?—so I may here explain that such an arrangement would prevent the rigid sides being apposed, and that the interposition of a short elastic tube prevents the glass nozzle being accidentally moved in the urethra during the compression of the syringe.

It may be necessary to explain that the rigid iron plates are completely covered, both on their inner as well as on their outer surfaces, with vulcanised india-rubber, so that they are absolutely secure against corrosion by any means; and I may add that the glass nozzle is provided with a boldly projecting shoulder, which prevents its being inserted too far into the rubber tube, and guards at the same time against the risk of the nozzle slipping down the urethra in case it should get unfixed, but it is so firmly held in the grip of the rubber tube that there is no fear of this. However, as a still further precaution the rubber tube may, if preferred, be drawn down over the glass one so as to come over and beyond the glass shoulder; but this is not needed.

I think it will be seen, without recapitulation on my part, that the syringe fulfils all the conditions that I started by naming as desirable ones. But I omitted one very important one, and that is cheapness. Now, at what price such a syringe might be made if any demand arose for it, I cannot say, but since one manufacturer offered to make me a gross of such syringes at a shilling apiece, I suppose they would not be very costly.

There is another question; it is this—May not so compact a contrivance prove itself as serviceable in the prevention as in the treatment of gonorrhoea? I believe it is pretty well acknowledged that the urethra, if promptly washed out, is much less liable to be attacked than it is when left uncared for, and that, for example, the injection of a solution of soap-and-water is a much more efficient prophylactic than the mere act of urination. However, the question of what solution may be the best prophylactic, or whether even it be good to employ any solution at all with that view, is one which I leave to those more competent than myself.—*Medical Times and Gazette*, June 10, 1882, p. 605.

66.—ON A SIMPLE OPERATION FOR VARICOCELE.

By ARTHUR E. BARKER, Esq., F.R.C.S., Assistant Surgeon at University College Hospital.

In the last three cases of varicocele upon which I have been called to operate, the method adopted has been very simple, and has been followed by such good results that it appears worth brief notice. It seems, too, very unlikely to be followed by any of those ill results and dangers of which most surgeons have seen something who have practised the older procedures. I may say that the three operations now recorded were done by way of experiment. Some time previously I had removed the enlarged right half of the thyroid gland with strict Listerian antiseptics, using seventeen silk and six catgut ligatures for vessels, &c. The wound healed rapidly (almost by first intention), although after the first day I used a dressing of salicylic wool without the spray, the wound having become fully exposed during the first night. Here not one of either the catgut or silk ligatures came away or gave any evidence of their presence under the skin; nor have they done so yet, nearly a year after operation. In thinking over this case, it occurred to me that the scrotum, from its position and structure, would be a good field in which to study (as far as this is possible in the living body) the behaviour of such ligatures embedded in healthy tissues. If no suppuration took place around them, we might be able by manipulation to ascertain how long they remained unabsorbed, and how much plastic change they provoked, with some other interesting points. If, on the other hand, they should suppurate and come away sooner or later, the patient would be in no worse condition than if operated on by one of the ordinary methods where suppuration is necessary. I also thought that it would be interesting to try whether it was not possible in this ligation to attain to and maintain perfect asepticity without the usual elaborate dressings of the Listerian method. The operation of tying the veins of the testicle, in short, appeared to offer a simple but fairly good means of testing practically whether it was possible, without the spray, to introduce a perfectly pure ligature into the tissues of the body, and to maintain such conditions of purity around it as might enable the silk to remain there without provoking any excessive reaction; also of observing what became of the knotted ligature eventually in the soft textures of the scrotum.

Having these three cases to operate on last autumn, I dealt with them as follows: two on one day, the other five days later. The skin of the scrotum was thoroughly cleansed with a 5 per cent. carbolic lotion, as also all instruments and the surgeon's hands, no spray being used. The scrotum was then

pinched up between finger and thumb in the usual way, so as to include the veins and exclude the vas deferens; it was then notched with a scalpel, and through the opening thus made a needle bearing a medium-sized twisted silk ligature (previously soaked for about an hour in the same carbolic solution) was passed. The veins were then allowed to slip backwards, and the needle was made to carry the silk forwards again through the same puncture, but this time in front of the veins. The latter were thus, of course, included in the two loops of silk leaving the scrotum by the same aperture. The ends of these were now tied tightly over the veins about one-eighth of an inch apart. They were then cut short and allowed to slip into the scrotal tissues. Everything was in the meantime protected from any contamination by frequent wiping with a carbolised sponge. A little padding of salicylated wool was the only dressing.

The results need only be briefly alluded to. There was a very trifling swelling around the seat of ligature for a few days, together with slight tenderness on pressure, otherwise nothing was complained of in the first two cases. In the third, considerable pain was felt for a day or two, and there was a little more swelling and tenderness. But in none of the three cases was there the slightest threatening of suppuration. The first left the house in ten days, the second within a fortnight, the last on the fourteenth day. They were then walking about without any discomfort, except the third, who, having had a very large varicocele, still felt a good deal of dragging in the loin on returning to his work, which was very hard, and some neuralgic pain. These, however, passed off later, under the use of laxatives for obstinate constipation from which he suffered, though he continued to work for long hours as a grocer's assistant. I watched all these three cases for several months, the last until quite recently, about a year after operation, and now regard all danger of the ligatures coming away as quite over. The latter could be felt under the finger as small knots deep in the scrotal tissues, which appeared quite normal. Whether they will ever come away remains to be seen, but this is immaterial, as far as the patient is concerned, for they give no trouble now.

Comparing these operations, as far as they go, with the older methods, their extreme simplicity is worth noting, as well as the small amount of trouble or inconvenience to the patient. It is also of some interest to note that, in these three cases at all events, it was possible to manipulate freely with silk ligatures, and yet introduce them in a sufficiently pure state to produce no suppuration of any kind; and all this with only the simplest precautions as to absolute cleanliness, and without

the carbolic spray. There is also a satisfaction in knowing that the veins are thoroughly occluded, and that there is no possibility of the ligatures slipping or being too soon absorbed, as might be the case with catgut. If nothing else, the operation appears an interesting experiment, and worthy of further trial.—*Lancet*, *Sept.* 30, 1882, *p.* 521.

SYPHILITIC AFFECTIONS.

67.—ON THE VARIETY AND DIFFERENTIAL DIAGNOSIS OF VENEREAL SORES.

By J. CARTER BATTERSBY, M.B., B.Ch., T.C.D., Surgeon,
Army Medical Department.

As the result of recent research in this country and abroad, and from individual observation, it would appear that two distinct classes of venereal sores exist—namely, first, those that are accompanied with and followed by constitutional symptoms; and, secondly, those that are not. The former have been designated hard or specific, and the latter soft or non-specific. It is, I think, a pity that these terms should have gained such universal acceptance, as they are not only partly erroneous, but liable to lead the inexperienced into much difficulty, and not unfrequently into errors of diagnosis and prognosis. It would be preferable (in the absence of less misleading names) to use the simple and intelligible terms, syphilitic and non-syphilitic, according as the local lesion with its accompanying symptoms presents the characters of a sore from which the constitution will become affected with syphilis or otherwise. As to the duality of the poison, we meet with many eminent surgeons who distinctly affirm that there is but one venereal poison capable of producing venereal sores, and that all such sores are syphilitic. That the constitution does escape contamination in certain cases, is ascribed to the early treatment and administration of mercury, &c.

There was a time when the physician drew no line of demarcation between typhus and typhoid fever, but at the present day there are few who will doubt that the one is as distinct from the other as variola is from varicella. Nor do we now believe that the poison of typhus can produce typhoid, or that of variola varicella. Each is perfectly distinct, has its own period of incubation, its own peculiar symptoms, and individual specific poison. By an analogous mode of reasoning, drawn from the result of practical observation and inquiry, we are, I think, rationally bound to admit that two distinct classes of venereal sores exist, that each has its own peculiar period of incubation, its own symptoms, and its own specific poison. Is

the poison, we may ask, which produces a syphilitic sore and infects the system with syphilis capable of microscopic examination or chemical analysis, and if so, does any perceptible organic difference exist between it and the peculiar specific poison which can only produce a mere local ulcer or ulcers, and which as such are never followed by constitutional symptoms? No solution to the above problem has as yet been satisfactorily determined.

In describing the local lesion or primary syphilitic sore which is always followed by constitutional symptoms, I have usually seen the following three varieties:—

1. *A sore or sores characterised by induration or hardness from the beginning and throughout its entire course.* This first variety may appear as (a) a “cupped-shaped” cartilaginous cavity of variable size, and situated on an indurated base, or (b) it may be seen as a superficial excoriation or elevated elliptical nodule of an ash-grey or livid colour, and generally situated on the corona glandis. Sometimes this first variety appears as (c) an induration beneath the true skin.

2. The second variety (*soft in its early stage, but subsequently becoming indurated*) is seen as a sore or sores which in their early stage simulate the non-syphilitic ulcer or ulcers, but subsequently become indurated and followed by constitutional symptoms. It is exceedingly difficult to diagnose this second variety in its early stage, as I believe it is invariably complicated by the existence of non-syphilitic sores, one or more of which after a variable time may assume the characters of the true syphilitic ulcer or ulcers. The question may arise as to how this peculiar change in the non-syphilitic ulcer takes place, and an explanation be called for. I believe it is due to the existence of a double poison manifesting itself in the one individual, contracted either at the same time (as we know that both classes of venereal sore may exist in the same person) or at different intervals. The period of incubation of non-syphilitic sores being much shorter than that of the syphilitic, they first appear, and whilst being treated the incubative stage of the true syphilitic sore is accomplished, and the lesion becomes manifest. The last case which came under my observation of this second variety of syphilitic sore is worthy of record, as it clearly illustrates the difficulty that attends our early diagnosis.

A corporal in the 4th Dragoon Guards was admitted to hospital under my care suffering from what appeared to be two ordinary non-syphilitic ulcers, situated on the upper surface of the glans immediately in front of the corona. The ulcers were shallow, and had all the characters of the so-called “soft sores.” After three weeks from admission to hospital both ulcers became elevated and livid, and presented the appearance

of "cupped-shaped" cartilaginous cavities situated on indurated bases; subsequently unmistakable secondary symptoms followed.

3. The third variety of syphilitic sore—namely, *that which is soft from the beginning and throughout its entire course, but followed at a given period by secondary symptoms*—I have usually seen on the external integument situated on the dorsum or side of the penis. When this sore comes under our observation it is generally of two or three days' duration, is circular in form, about the size of a sixpence, edges irregular and sharp, surface presenting a finely granular appearance of a yellow-pink colour, and having a thin ichorous discharge. There is no induration accompanying this sore, either in its early stage or after it has healed, and it is invariably followed by constitutional symptoms. Again, it is our lot to see a sore situated probably on the side of the corona and glans, which rapidly spreads in circumference and depth; the edges seemingly raised, the surface deep and irregular, of a dark or livid colour, and discharging a thin watery fluid. I have been unable to detect any induration about this sore, and have seen it followed by severe secondary symptoms.

Having described and attempted a classification of those ulcers and lesions which I have seen followed by constitutional symptoms, I shall endeavour, under the head of Class II., to point out the non-syphilitic sores which, as such, are never followed by secondary symptoms.

1. A sore or sores, having a great tendency to multiply, often numbering as many as twenty, and generally situated in the hollow between the glans and the prepuce, on the corona glandis, prepuce, frænum, glans, in the meatus, urethra, or on the external skin. These ulcers are first noticed from twenty-four to forty-eight hours after coitus; in some cases, however, they may not appear until the fourth or fifth day. There is generally a good deal of heat and itching about the parts, the ulcers, as a rule, being round or elliptical in shape, and of variable size, very shallow, edges sharp, surface yellowish-pink colour, discharging pus, and surrounded by a narrow red areola. There is no induration from the beginning or throughout the entire course of these ulcers, unless, as sometimes happens, induration occurs as the result of certain local applications.

2. A sloughing sore which may begin as such or appear so shortly after the ordinary sores are discovered.

3. Gangrenous ulceration or sloughing phagedæna is, fortunately, of rare occurrence; when it does take place the greater portion of the organ may be destroyed. It would appear that an elongated prepuce predisposes to this formidable affection, the upper portion of which first becomes affected. It is, I

think, well to give a very guarded prognosis in all cases of sloughing or phagedænic sores. The ordinary non-syphilitic ulcers must not be confounded with herpes or aphthæ of the glands and prepuce, or with what sometimes occurs, a ruptured frænum, the result of mechanical violence. These, as a rule, occur after connexion, have no specific characters, and are unaccompanied by glandular or other complications.

The following table, giving the differential diagnosis between syphilitic and non-syphilitic ulcers, may be useful in helping to form an early and correct opinion of venereal sores.

Syphilitic Ulcers or Lesions.

1. Incubation ten days to eight weeks.

2. Collateral symptoms: Probable congestion of soft palate and tonsils, slight induration of lymphatic glands in groin, drowsiness, headache, and depression of spirits.

3. Primary lesion or lesions assume some of the varieties described under Class 1.

4. Thin ichorous discharge.

5. Generally single.

6. Glands in groin enlarge, but seldom suppurate.

7. Fever present after a short time.

8. Ratio to non-syphilitic ulcers 1 : 4.

9. Constitutional symptoms invariably follow.

10. Can only have one attack, unless, as in certain rare cases of small-pox, the system, after the lapse of many years, becomes liable to a second seizure.

11. Prognosis unfavourable; must be guarded, and given in accordance with the severity or otherwise of the secondary symptoms.

—*Lancet*, Sept. 2, 1882, p. 346.

Non-syphilitic Ulcers.

1. Incubation twenty-four hours to five days.

2. Collateral symptoms: Probable enlargement and swelling of one lymphatic gland in groin.

3. Ulcer or ulcers assume the characters described under Class II.

4. Discharge always pus.

5. Seldom seen as a single ulcer, and have great tendency to multiply.

6. An isolated gland becomes swollen, and frequently suppurates.

7. Fever absent, unless due to suppuration.

8. Ratio to syphilitic ulcers 4 : 1.

9. Constitutional symptoms never follow.

10. May suffer repeatedly from such sores.

11. Prognosis (as to the liability of the system becoming affected) always favourable.

68.—TREATMENT OF CHANCER BY GLYCERINUM BORACIS.

By GEORGE THIN, M.D., London.

The experience of the last few years has satisfied me that in various forms of skin disease a simple non-irritating antiseptic application frequently leads to a speedy recovery. Amongst the antiseptic substances with which I have experimented I may instance borax as one that I believe will be found eminently useful in cutaneous affections. As an example of its beneficial action I propose to relate the history of three cases of chancre treated by glycerinum boracis, with results that I feel sure will encourage practitioners to give the method of treatment a more extended trial. I was induced to try this application by its good effect in the first case which I shall relate. As I did not take notes of the case I describe it from memory.

Case 1.—In February, 1881, a man brought his wife to me and gave the following history. When on a visit to Paris he had contracted several chancres, which were cauterised and seemed to heal quickly. On his return to London he infected his wife, but his desire to conceal from her the nature of her malady led to delay in seeking advice. Eventually she had been placed under medical care, and subjected to the ordinary routine treatment for chancre. She had had the sore cauterised on three different occasions, at intervals of several weeks, and had applied continuously water-dressings and black wash. Caustic had been last applied about a week before I saw her. She described her condition as being worse since the application, and complained much of the pain. The sore had latterly been steadily enlarging. I found a chancre as large as a six-pence at the entrance of the vagina on the left side. It was covered, except at the edges, with a black sloughy-looking mass. The edges were white and irregular, and the border of the sore was considerably inflamed. The sloughing appearance of the chancre, and the inflamed base, naturally suggested to my mind the action of a poison which was rapidly multiplying itself, and on the chance of the poison being parasitic—being a “germ”—I bethought myself of an anti-parasitic (or antiseptic) remedy and directed the sore to be kept bathed in glycerinum boracis. The rest is soon told. With the borax solution the inflammation speedily subsided, the surface became clean, and the ulcer healed without a troublesome symptom. Whilst this sore was being successfully treated a vesicle appeared on the fourchette. It soon ruptured, and left a small chancre, which did not spread laterally, but penetrated into the tissues. When my attention was called to it, a probe passed inwards for a quarter of an inch. I directed a solution of carbolic acid in alcohol to be applied, but this failed to get

to the bottom of the sore, which continued to get deeper. I then procured proper instruments for the patient, and instructed her attendant how to plug the narrow channel with cotton wadding soaked in glycerinum boracis. From that time the canal-like sore began to fill up from the bottom, and soon healed completely.

Case 2.—A commercial traveller contracted a number of chancres about the middle of July, 1881. There were four on the glans penis, one on the frænum (which it destroyed), and two on the prepuce. Phimosis supervened, and on August 1st he laid up for treatment whilst on a provincial tour. Zinc ointment and black wash were applied, but the inflammation increased. About the second week of August he observed that there was also urethral discharge, and at the same time an inflamed gland in the right groin suppurated and eventually discharged. The sores were now painted with tincture of iron, which improved their condition. In the first week of September caustic was applied to them, with the effect of great increase of the inflammation. When he came to me on September 24th he had phimosis, with considerable pain and swelling, and it was impossible to retract the foreskin sufficiently to see all the sores. One on the glans penis, which was brought into view, was covered with a dirty-grey membranous looking substance. I directed him to insert with a blunt probe pieces of lint soaked in glycerinum boracis, so as to keep the glans and inner surface of the prepuce completely bathed in the solution. When I saw him five days afterwards, I was able to retract the foreskin completely, and I found all the sores clean and healthy. When he came a third time a week afterwards, they were nearly well. He did not find it necessary to visit me again, but I subsequently learned from him that a few days after his last visit he was perfectly well.

Case 3.—A powerfully built young man, an engineer, consulted me on September 25th, 1881, and gave the following history. In the beginning of July he contracted a chancre for which he was treated at first by a chemist, who salivated him without any effect having been produced on the chancre. He had then consulted a medical man, who burnt the chancre with caustic on three occasions, and directed the constant application of black wash. In spite of these measures the sore refused to heal. When he came to me I found a nearly circular sore about a third of an inch in diameter on the inner surface of the foreskin, having a greyish surface with a few red points. I ordered the constant application of glycerinum boracis. In two days the aspect of the chancre had changed, and it was less irritable. In a week it was well.

I trust that the results which I have described will lead to a

more extended trial of this simple treatment. The theory on which the method was conceived was that of keeping the surface of the sore saturated with a solution that would effectually prevent the development of organisms. Those who may feel disposed to try the remedy will, however, judge it by its efficacy in converting a poisoned into a healthy sore, and will not be prejudiced by theoretical ideas regarding the pathology of chancre. If opportunity unfortunately offered, I should feel encouraged to urge a trial of this remedy in phagedæna and hospital gangrene. The well-known efficacy of the continuous bath in the latter disease possibly owes its power to the arrest of the development of micro-organisms—an effect that is attainable by the free and constant application of glycerinum boracis.—*Lancet*, May 27, 1882, p. 864.

69.—ON THE ABORTIVE TREATMENT OF GONORRHŒA.

By W. WATSON CHEYNE, M.B., F.R.C.S., Assistant
Surgeon to King's College Hospital.

In the *British Medical Journal* for July 24th, 1880, I published an account of a new method which I had introduced for the purpose of arresting gonorrhœa, and it is with the view of giving the results of my attempts to cut short the gonorrhœal inflammation that I publish the present paper. The principle on which I started was, to quote from my former paper, that “the extreme contagiousness of this disease, the existence of a distinct period of incubation, and the steady spread of the inflammation, all point strongly to a parasitic origin.” I had found micro-organisms of a particular kind always present in gonorrhœal pus, and they have also been described by other writers, and, reasoning from analogy, I concluded that gonorrhœa was probably due to the growth of an organism in the mucous membrane of the urethra, giving rise to a more or less acute inflammation of its mucous membrane. I will not discuss here the accuracy of my views, for I hope shortly, in conjunction with Mr. Jennings Milles, to publish an account of some investigations which we have been making on the subject.

Granting, however, that these views are correct, and that gonorrhœa is due to the continuous growth and spread of something introduced from without, possibly belonging to the group of schizomycetes, it is evident that the destruction of these bodies, or the arrest of their growth, ought to stop the progress of the symptoms, supposing that the agent employed for this purpose is of itself innocuous. This is what I have tried to do, and what, probably, happens in the other methods of abortive treatment when they are successful; for the injections

of nitrate of silver and Niemeyer's tannin and alcohol solution are to some extent destructive of plant life; while Johnson's method of frequent irrigation of the urethra washes away the products of growth of these organisms, and possibly many of the organisms themselves. As I pointed out in my former paper, the organisms probably require for their easy spread that the mucous membrane be diminished in vitality. This they do by the products of their growth, which irritate and cause inflammation of the mucous membrane; and when the resisting power of the tissue has been in this way diminished, they grow in it with ease. Now, if these products are constantly washed away, this weakening of the tissue is not so great, and the growth of the organisms in it occurs only with difficulty. If, however, the organisms have got a good hold of the tissue, very little benefit can be derived; and experience has shown that the method is of little use when the acute symptoms have advanced before it is begun. The mode in which large doses of copaiba act is less evident. We know from Ricord that it does not produce its effect through the blood, but that it is excreted by the kidneys in some altered form; and that it is the urine containing this product of the introduction of copaiba into the system which, passing over the mucous membrane in the urine, brings about the good result. It may be either that it is a parasiticide, or that it has some special effect in arresting the inflammation. I have not yet tested the parasiticide properties of such urine; but in one case, where I kept it for several days, it certainly did not decompose so soon as would have probably been the case had copaiba not been previously administered.

The materials which I employed with the view of destroying the cause of gonorrhœa were chiefly iodoform and eucalyptus oil, and these I still use. As injections are apt not to penetrate sufficiently far, and as their effect is only momentary, I combined these substances with cocoa butter, and made them up in the form of solid rods about 4 in. or 5 in. in length, and about the thickness of a No. 10 catheter. These rods weigh forty grains each, and each contains five grains of iodoform and ten minims of eucalyptus oil. They are dipped into eucalyptus oil, introduced into the urethra, over the orifice of which a pad of boracic lint is applied, and outside this a large piece of gutta-percha tissue, the whole being fastened on by strapping, and retained for four or five hours if possible. The cocoa butter soon melts, and a solution of iodoform in eucalyptus oil bathes the mucous membrane for some hours. Another rod may then be inserted, and a suitable injection employed afterwards. This method is only of use, in my experience, before or during the inflammatory stage, and I employ

it at any time till the inflammatory symptoms have disappeared, but generally within the first seven or eight days after the commencement of the discharge.

I may sum up the results of this investigation shortly as follows: The treatment recommended here—the use of one or two iodoform and eucalyptus rods, an injection of sulphocarbolate of zinc, and the internal administration of copaiba—has the effect, in the great majority of cases of acute gonorrhœa, of checking the acute symptoms in a day or two, and bringing the disease rapidly to the chronic stage, thus avoiding all the risks dependent on the violence of the inflammation. The discharge at this time is very amenable to treatment, and gets rapidly well under the use of suitable remedies. All that I claim for the method, however, is that it cuts short the acute stage, in the great majority of cases, and thus the patient escapes the dangers and pain incident to that stage. The essential parts of the method are the use of the bougie and the injection; but the rapidity of cure is much aided by commencing the use of copaiba or sandal oil at once. The method may be employed at any stage of the disease, but is, in my experience, only of use before or during the acute stage, up to (say) the eighth day. The result is the more marked the more acute the inflammation, the rapid subsidence of the inflammatory symptoms being very striking. Even in the very few cases in which it has failed to produce this effect, it has not, so far as I can judge, done any harm. The addition of bichloride of mercury, though a powerful antiseptic, to the rod, or its use in the form of injection, does not seem to be of advantage. It is possible that the combination of counter-irritation with this method may yield even more rapid and satisfactory results.—*Lancet*, Aug. 5 and 12, 1882, pp. 176, 213.

AFFECTIONS OF THE EYE AND EAR.

70.—ON VARIOLOUS AFFECTIONS OF THE EYE: THEIR PATHOLOGY AND TREATMENT.

By MONTAGUE D. MAKUNA, Esq., L.R.C.P.Lond., late Medical Superintendent, Fulham Small-pox Hospital.

It is very singular that our writers on ophthalmic medicine and surgery—men of great ability, experience, and observation—should give so scant and imperfect a description in their works, otherwise comprehensive and elaborate, of the affections of the eye in small-pox. This, doubtless, arises from the fact that chances of observation in this particular disease seldom occur to them; while it is still more singular that extensive experience gained in our metropolitan and provincial small-pox hospi-

tals, as well as by those experienced in epidemiology in different quarters of the globe, should contribute little or nothing to its literature, to elucidate its pathology and treatment.

It was in the year 1837 that Mr. J. F. Marson, of Highgate Small-pox Hospital, related his experience of these affections, in his 1,500 cases of small-pox, before the Westminster Medical Society. Although it is a valuable contribution, as far as the clinical observations are concerned, it falls far short of the requirements of the present generation of medical men, as, during the lapse of the last forty years that have expired, the anatomy and physiology of the eye have made such rapid strides as to bring our knowledge of them to a point of exactness. The only other descriptions of these affections in the English literature, so far as I can know, are those given in the works of Dr. W. Mackenzie (1854) and Mr. J. Soelberg Wells (1873). Although they are excellent in many respects, they are wanting in preciseness of their clinique and pathology, I presume from their want of observations; while Mr. C. Macnamara, in his work on the Diseases of the Eye (1872), makes no mention whatsoever of variolous corneitis—an affection that is the principal cause of loss of sight in this exanthematous disorder, especially among the unvaccinated and uncivilised communities of the globe. He alludes to the subject of the ulceration of the cornea, I believe wrongly, meaning the former sequela of the disease. I have contributed this paper, fully anticipating that it may draw the attention of those who are far abler to treat the subject, and who have had much more extensive experience, to throw better light on it.

In variola, the complications of the eye are principally confined to the eyelids, conjunctiva, and cornea. Other structures are apt to suffer by the extension of the inflammation, but it is of unfrequent occurrence in the hands of a practised physician. That suppuration and disorganisation of the eyeball does now and then occur from incipient and rapid inflammation, I do not doubt; but when one sees more of this practice, the more he is convinced that the loss of sight, due to permanent opacities of the cornea, partial and total staphyloma, or otherwise, arises from want of care and proper treatment on the part of physicians in hospital practice, owing to the severe pressure of work in an epidemic, and negligence on the part of the patients both at hospitals and at home.

Eyelids.—Pustules on the cutaneous aspect of the eyelids are not so frequent as on the other parts of the face, especially the cheeks, nose, and its surrounding parts. They are very frequently seen at the edges of the eyelids, between the eyelashes, causing a good deal of irritation and pain, destroying the hair-bulbs, and thus producing the permanent loss of eyelashes,

called madarosis. If they are within the margin of the palpebral conjunctiva, they may obliterate the openings of the Meibomian glands, and cause a stoppage and alteration in their secretions. They may cause entropion. The formation of pustules on the cutaneous surface of the eyelids is accompanied with much swelling, which is soft and œdematous. But it is seen usually with that of the face in severe cases of small-pox, frequently confluent, and without any pustules on them, at the commencement of the eruptive stage. It generally lasts till the eruption has advanced to the pustular stage, and then subsides with that of the face. It causes the closure of the eyelids during this period. Again, the vitiated secretions in the Meibomian glands and discharges from the pustules on the edges of the eyelids glue them together, so that the eyes cannot be opened for days, especially when accompanied with swelling. But at last, when the disease subsides, the eyes are opened again, uninjured. It is in this way that we hear talk of persons being blind in small-pox for so many days, and recovering their sight. In severe cases, the edges of the eyelids are rendered irregular, and liable to inflammation and excoriation from slight causes, which produce ophthalmia tarsi (Mackenzie).

Treatment.—The eyes should be bathed with warm water two or three times a day. When there is a good deal of swelling, warm fomentations do well. It must be our constant endeavour to prevent the eyelids from sticking together, in order to ascertain the injury to the inner parts. This can be effected without any difficulty, by dropping a drop or two of pure castor-oil in each eye after bathing. Unguentum cetacei or cold cream might also be used with advantage. As soon as the vesicles are maturing, they should be opened up from side to side with a fine flat needle to prevent further suppuration and destruction of the surrounding structures. I have seen nitrate of silver stick applied on the outer surface of the eyelids to cause subsidence of the swelling, with no benefit. Besides, the operation is attended with irritation, pain, and disfigurement. In the entropion, the eyelashes ought to be removed to prevent irritation of the eyeball.

Conjunctivitis Variolosa.—Inflammation of the conjunctiva in small-pox stands next in point of frequency to that of the mucous membrane of the mouth, pharynx, and respiratory tract. It occurs in about 8 per cent. of the total cases, both mild and severe, vaccinated and unvaccinated, and at all ages. Variola is not unfrequently an exciting cause of conjunctivitis in children of scrofulous diathesis, and in them it is most obstinate and difficult to cure, sometimes lasting from four to ten and twelve weeks. In them it runs on to granular lids; and the detection of the first traces of the inflammation of the

cornea require a careful watch. It not uncommonly occurs during the first five or six days of the eruption. It is stated by some that vitiated secretion of the Meibomian glands, pent up during the closure of the eyelids, when they are swollen, is its exciting cause. But I am not prepared to verify this statement, as I have seen conjunctivitis in cases without swollen eyelids. In many cases it is local, and situated between the lesser canthus and the cornea, in the shape of phlyctenular conjunctivitis; and I have often thought that these phlyctenulæ near the circumcorneal zone, might be the variolous eruptions. By analogy of observation, we know that the eruptions on the mucous membranes of the mouth and pharynx are first to mature and heal; as these formations last but two or three days, leaving the conjunctival inflammation behind, I am led to believe that there might be some modification of the characteristic eruption. I have seen about five or six cases of the variole on the ocular conjunctiva, and one on the sclero-corneal junction, on the outer aspect of the eye, in my nearly 1,500 cases. I have seen but one case of variola on the central part of the cornea, in my student days in Bombay. This conjunctivitis, unlike the ordinary phlyctenular form, is found more frequently in one than in both eyes. In some severe cases of confluent variety, the inflammation is diffused, and assumes the type of catarrhal conjunctivitis. Chemosis occurs in about 1 per cent. of the cases. It is more liable to occur in variola hemorrhagica, associated with hemorrhagic blotches and petechiæ on other parts of the body, and then it is due to the exudation of the colouring matter of the blood in the tissues of the conjunctiva and the subconjunctival layer, and not to inflammation. Sometimes it takes months and months for the colouring matter to be absorbed and the disfigurement to disappear. The granular lids are formed usually in scrofulous children, and in two of these cases, where the ulcers were detected on the palpebral layer, I thought they might be due to the remnants of the varioles. When the eyelids are swollen, acute variolous conjunctivitis is known by the patient complaining of the pain in the eyeball, increased on attempting to move the eye or to open it; a feeling of grittiness and running of hot tears. I have seen but one case of a purulent ophthalmia in my practice. I have here sufficiently drawn the peculiarities of the affections of the conjunctiva, and I need not describe their subjective and objective symptoms, as they are fully treated in the descriptions of the ordinary cases in works on ophthalmic medicine and surgery.

Treatment.—In mild cases, dropping a few drops of sulphate of zinc lotion (three grains to an ounce), three or four times a day, is all that is needed. In other cases nitrate of silver

lotion (one grain to an ounce) answers well. In some cases, where the phlyctenular vascularity is small, circumscribed, deeper, and formed of larger vessels, I dust in the eye a few grains of powdered calomel. When it is associated with inflammatory redness and thickening of the lids, I smear unguentum hydrargyri subflavum between the eyelids; it is readily absorbed by the conjunctiva, and prevents them from sticking together. In severe cases with a good deal of muco-purulent discharge, I drop solution of nitrate of silver (10 to 20 grains to an ounce), after everting the eyelids, followed, soon after, by the solution of chloride of sodium, to neutralise the excess of the silver salt, once a day, and followed during the rest of the day with cold water lint on the eye, and drops of the weak solution of sulphate of zinc. When the inflammation is chronic, solution of sulphate of copper (3 to 5 grains to an ounce); or vinum opii might be used with advantage in some cases, especially in those where there is turgidity of the circumcorneal zone, threatening cyclitis and inflammation of the deeper structures of the eye. In a few obstinate cases I have used blisters behind the ears with good results. In cases of granular lids, lapis divinus and dilute nitrate of silver points have been used. Iodide of potassium solution (3 grains to an ounce) might be used to promote absorption of the colouring matter of the blood exuded in the subconjunctival tissue in hemorrhagic cases. Fomentation of poppy and belladonna is useful when there is pain over the eyebrows and supra-orbital headache; in these cases, smearing with belladonna and glycerine might be used with advantage. Internally I do not drug my patients much. Weak, anæmic, and scrofulous children require ferruginous tonics, as syrup of phosphate of iodide of iron, with or without cod-liver oil, chemical food, etc. In grown-up persons tincture of perchloride of iron with glycerine and quassia, or citrate of iron and ammonia, with a vegetable tonic, are indicated. Cleanliness, fresh air, nutritious diet, form the very backbone of treatment in these affections, as in all the maladies human flesh is heir to.

Variolous Corneitis.—It has been appropriately remarked that cornea serves as an indicator of disease and malnutrition. Whatever cause induces the poverty of the blood, disease, starvation, or age, also tends to the malnutrition of the cornea, resulting in inflammation, opacity, or degeneration. It is one of the most sensitive organs of the body, and is most readily affected by the slight derangements of circulation. The glow of life and intelligence of a healthy person is read in its brightness, whilst the painful anxiety and vacant stare of another depicts his misery on its lifeless surface. Consequently, that acute exanthematous diseases like variola should tell on its nutrition

and induce inflammation in its structure, is only natural as cause and effect, in cases where there are anæmia and exhaustion. The nutrition of the cornea is performed by dialytic action, and is dependent on the vessels of the conjunctiva and circumcorneal zone, and it is for this reason that in cases of chronic conjunctivitis opacity of the cornea is the result. The cornea is also affected in scrofulous subjects, in whom chronic conjunctivitis is of frequent occurrence. To these constitutional causes, may be added the vitiated secretions of the Meibomian glands and conjunctival tissue and granular lids as the local causes. It is an inflammatory affection, and I think it can be appropriately designated "variola corneitis." In severe and neglected cases it is associated with iritis, choro-iritidis, abscesses, suppuration of the eyeball, and its disorganisation. It is still described by some as "corneal ulcer," from want of correct understanding of its pathology. I cannot do here better than quote Mr. Macnamara's remarks on the general pathology of corneitis:—"The cornea we know to be a non-vascular structure; and formerly, when hyperæmia was regarded as the first and most essential step in inflammation, it was difficult to see how the cornea could be the seat of it. But now that we have learnt to look rather to the elements of a tissue, as the point of departure for inflammatory changes, and to regard vascularity and hyperæmia, however important, as accessory phenomena, the cornea becomes one of the most appropriate tissues for the study and illustration of the modern doctrine of vascular pathology."

The frequency of this affection in my cases, as well as in those of Mr. Marson, is nearly the same—viz., 1.7 per cent. It more frequently occurs in one eye than in both. It is of much more frequent occurrence during the stage of scabbing, from the twelfth to the fourteenth day of eruption, when the patient is getting over the secondary fever, and is associated with the formation of furunculæ and abscesses in other parts of the body, in severe and confluent cases. It is for this reason that Dr. W. Mackenzie describes it as "corneitis postvariola," or "secondary variolous ophthalmia." But we do come across cases, especially those of scrofulous children and others, in whom the disease has been mild and of discrete variety, where it makes itself manifest during the course of the first week, and in whom the secondary fever and subsequent exhaustion is *nil*; and the only complication is the eye affection. It generally begins at the margin of the cornea, and then extends to the centre. In rare cases, it is developed in more than one point at the same time, or is central; these cases must be looked upon with grave apprehension. It comes on very insidiously, and often without any pain or knowledge of the patient; and it requires a careful

watch on the eyes of the patients to discover it early, and nip the malady in its budding stage. Occasionally, it runs on a very rapid course, involving the cornea and deeper structures within forty-eight hours. As Marson remarks, an experienced eye can sometimes prognosticate its approach, from the dull and lifeless surface of the cornea after exhaustion from secondary fever. But it is impossible to do so in mild and discrete cases of scrofulous subjects.

When the variolous corneitis commences, the surface of the cornea looks dull, dry, and at the seat of lesion, uneven. Sometimes, the superficial or epithelial layer is raised so much by the rapid cell-proliferation, that I was once inclined to believe that these elevations were due to the formation of vesicles; but such is not the fact. Within a few hours, this spot is rendered hazy and a white point appears, which becomes more and more extensive and nebulous. In some cases, it is attended with severe pain, and much photophobia; but these symptoms are not so frequent in this variety of corneitis as in the others. By proper care and treatment, the mischief ends here; the inflammatory exudation is absorbed, and no traces of the disease are left. But when it extends a stage further, the inflammation attacks the laminæ of the cornea proper, the corneal corpuscles swell, are rendered more opaque by granular deposits in them, and are increased in number. The inflammatory exudation takes place between the laminæ of the cornea proper, I believe, through the system of canals in which the processes of these corpuscles lodge. A stage further, and an abscess in the cornea is formed. This abscess is more frequently opened on the surface than in the anterior chamber, giving rise to partial staphyloma and prolapse of the iris. It is only in rare neglected and insidious cases, running on to rapid disorganisation, that total staphyloma, acute glaucoma, and suppuration of the eyeball, take place. In two of the microscopical slides prepared for me by Dr. Klein, I have seen micrococci in the anterior epithelial layer, at the seat of the inflammation. Although I am inclined to the parasitic theory of the infectious diseases, I am not prepared to class these micro-organisms in their etiology. They have been sufficiently demonstrated in all of them, but as yet as their concomitants and in their advanced stages, and not as their causation. The loss of sight in this affection is frequently due to leucoma, sometimes to partial staphyloma, and rarely to total staphyloma. When the lesion is situated in the centre, and associated with granular lids, it is in the form of a "pannus." In severe cases it is more or less associated with iritis, and rarely with cataract. In the latter complication, I have frequently seen the lens escape; and, in one case, I have performed iridectomy, and

removed the lens, through the opening of the abscess, with good result.

Treatment.—Constitutional treatment plays a prominent part in this affection. Nutritious and generous diet, that can be readily assimilated by convalescents; wines to stimulate circulation and increase the appetite; and tonics—are necessary. Locally, in all these cases, it has been my plan to use lotion of belladonna with sulphate of copper, with tepid water, placed over the eye with a piece of lint soaked in it. I have invariably found it to answer its purpose. When it is associated with iritis, drops of liquor atropiæ sulphatis are used as usual. When an abscess forms in the cornea, it is best to open it. In one case of acute glaucoma and disorganisation of the eyeball, I performed the operation of enucleation. In cases of partial staphyloma and leucoma, it is better to wait, and leave the patients in the hands of the ophthalmic surgeons for proper treatment. In children, and in some patients, I have found it exceedingly difficult to keep their eyes at rest—an important factor in the success of their treatment—and prevent them from scratching. In these cases, I have used the Cellini eye-protectors, of which Dr. L. Herbert of Paris speaks highly. They are made of zinc, and are of two varieties, perforated and non-perforated. I prefer the latter, as they keep the eyes cool. They are of the size and shape of the eyelids, over which they are fixed by an elastic band, that goes round the head. They keep the eyelids at perfect rest, and prevent them from scratching. When worn once or twice, they are of no more trouble to the patients than spectacles are. I am not prepared to vouchsafe the physical and chemical properties claimed for them.—*British Medical Journal*, June 3, 1882, p. 812.

71.—THE ADVANTAGES OF PRELIMINARY IRIDECTOMY IN EXTRACTION OF CATARACT.

By FRANK H. HODGES, F.R.C.S.Ed., Ophthalmic Surgeon
to the Leicester Infirmary.

On my appointment as Ophthalmic Surgeon to the Leicester Infirmary, five years ago, I sought the advice of Mr. Critchett and Dr. Snellen of Utrecht, as to the safest method of extracting cataract. Both were emphatically in favour of performing an iridectomy some weeks prior to the extraction; Mr. Critchett remarking, "If my eternal salvation depended upon the success of a single case of cataract, I would do a preliminary iridectomy;" and Dr. Snellen, "Were I to operate on my own father I should do a preliminary iridectomy." Dr. Snellen further informed me that his custom was to tell his patients that the usual operation at one sitting (Graëfe's method) was as

very successful procedure, but that dividing the operation by doing an iridectomy first, and extracting the cataract later on, was somewhat safer, though necessarily the cure was a little delayed; then leaving the choice of operation to the patient.

With regard to the interval that should elapse between the iridectomy and the extraction, Dr. Snellen's rule was "not before six weeks, preferably eight." I have hitherto maintained the latter interval, though I think the rule that my friend, Mr. Priestley Smith, adopts, of doing the extraction as soon as any vascularity in the region of the iridectomy wound has subsided, is perhaps better than any arbitrary fixed interval.

Of the comparative advantages of this method of extraction, if any, over the more usual methods, I have no personal experience, having during the last five years performed preliminary iridectomy in all cases of extraction of senile cataract. Experience of it, however, leads me to claim several conspicuous advantages; and of these I would place first, "absence of hemorrhage from the iris at the time of the extraction." In my first case in private practice, the subject of which was a gouty old lady, on division of the iris the anterior chamber filled with blood, which occupied six weeks in absorption. A sharp attack of gout came on four days after the iridectomy, but fortunately did not affect the eye. At the extraction eight weeks later, another attack of gout occurred, and this time the iris became involved, but yielded promptly to leeches and atropine, with colchicum internally. The old lady made an excellent recovery, and can now read No. 1 fluently. The cataract had a small hard nucleus with abundant soft cortical substance, which I could not completely remove, and I believe that the preliminary iridectomy turned the scale from failure to success; for, had the complication of hemorrhage in a chamber with cortical substance been added to the existing one of gouty iritis, it is highly probable the eye would have been lost.

Besides the greater safety to the eye from the absence of blood in the anterior chamber, it is a manifest advantage to the operator not to have the parts obscured in the important stages of laceration of the capsule and extraction of the cataract. Another advantage of dividing the operation is the experience gained at the first as to how the anæsthetic is borne. My practice is always to give an anæsthetic for the iridectomy, ether or ethidine bichloride for patients under sixty, and chloroform for those over; and then, if this be badly borne, or cause much after-sickness, for the extraction either to give no anæsthetic or substitute another. Of the minor advantages, I would instance the tranquility of mind with which a patient awaits the extraction after a painless iridectomy followed by the usual rapid recovery. I have had several patients, who

prior to the iridectomy were dreadfully nervous about it, or more usually the anæsthetic; who upon suffering no inconvenience from the anæsthetic nor pain from the iridectomy, submitted calmly to the subsequent extraction. Again, cataract not unfrequently happens to people in excellent health, who have never been laid up for a day, and to whom confinement is necessarily irksome. The little preparatory training which they get for the iridectomy stands them in good stead for the all-important extraction, and accustoms them to the new sensation of having the eyes bandaged, and of lying on only one side or the back, and to the maintenance of perfect quiet. These latter may seem trifles, but success in eye surgery often depends upon scrupulous attention to many minor points of detail.—*British Medical Journal*, Sept. 2, 1882, p. 424.

72.—ON ESERINE AND PILOCARPINE IN GLAUCOMA, AND ESERINE IN OCULAR NEURALGIA.

By SIMEON SNELL, Esq., L.R.C.P., M.R.C.S., Ophthalmic Surgeon to the Sheffield General Infirmary, &c.

Eserine in Glaucoma.—The importance of estimating aright the value, or otherwise, of any remedy in this terrible malady is so great, that no apology is needed for the following practical remarks and relation of cases. I have for several years made use of eserine in the treatment of glaucoma; and much has been written on the subject by ophthalmologists in all parts.

As to the value, in certain cases of acute glaucoma, of eserine, there can be little doubt. Several such have been recorded. It is, however, difficult to judge beforehand as to the precise case that will benefit by this drug. I apprehend, therefore, that, in this acute affection, its employment will be limited to those cases where, either from unwillingness on the part of the patient to submit to iridectomy, or other reason, the immediate performance of the operation is forbidden. Experience teaches the importance of not placing too strong reliance in the efficiency of the drug to the fatal postponement of the operation; and it seems to me particularly important to urge this, as those, not seeing much of eye-diseases, may be tempted, observing the very satisfactory results occasionally recorded, to resort to the use of eserine when operative measures should have been considered.

The following cases illustrate the good resulting from the employment of eserine.

Case 1.—W. R., aged 49, applied at the Sheffield General Infirmary on January 24th. It appeared that on the evening of the day but one previously (thirty-six hours), he had suddenly experienced severe pain in the left eye, extending into

the forehead and temple, with very marked diminution of sight. When seen, he was still suffering acute pain. The cornea was "facetted"-looking, and the refractive media turbid. Tension $= +T_2$. He could see little more than shadows. His condition was unmistakably that of acute glaucoma. For, about three weeks previously, he had noticed "colours" round a flame, and thought his sight was not so good as formerly. He was taken into the operating theatre, with the object of performing iridectomy; but, I believe in consequence of his declining to remain as an in-patient, it was not done; and he was allowed to go home, with a one per cent. solution of eserine to be dropped into the eye four times daily. Three days later, he appeared with a cheerful face, stating that the intense pain subsided the same night that he commenced the instillation of the drops, and that vision had returned. He could now read Jäger 1; Tension, T_7 . February 3rd. Vision was $= \frac{20}{XL}$, the eye still being under the influence of eserine. February 10th. He was allowed to discontinue the drops. February 17th. His condition was quite satisfactory.

It should be added that, three or four months before the onset of this glaucomatous attack, he had been struck over the eyeball with a large piece of metal; the case may possibly, therefore, be considered "traumatic."

The result in the foregoing case is similar to what has happened before in my own experience, and in that of others; and some, at all events, would seem to have received permanent benefit.

In chronic glaucoma, the effect of eserine is more uncertain and less beneficial than in the class of case to which I have here just referred, and one will be very often disappointed in its use. On the other hand, the cases which I record further on show that it not uncommonly is of value, in some in material visual improvement, and in others in apparent arrest of the progressive character of the disease. I have noticed, also, an enlargement of the field of vision in a case otherwise benefited by its use. Here, also, there seems to me no very definite guide as to the cases it is likely to benefit, beyond that it appears essential that its myotic effect be well produced; but it does not, on the other hand, improve anything like the number of cases in which this indication is fulfilled.

Case 2.—E. H., aged 53, was admitted an out-patient, at the the Sheffield General Infirmary, August 15th, 1879. The right eye commenced to fail in the previous January. There was no pain. His sight was much worse lately. Iridescence had existed three or four weeks. When seen, he read Jäger 10. Tension $= +T_2$. There was cupping of the discs. In the

left eye, there were merely perception of light and marked cupping of the disc. Eserine drops were ordered. On August 26th, he read Jäger 2; tension was reduced. On Sept. 16th, he read a good deal of Jäger No. 1. On October 14th, the drops were omitted. On the 28th, eserine was again ordered; he read Jäger 4. On Nov. 5th, he read Jäger 2; tension was noted as normal; the drops were omitted. On the 25th, he read Jäger 2, easily. Several months later, his condition was equally good.

Case 3.—Mary E. S., aged 39, widow, was admitted as an out-patient at the Infirmary on September 26th, 1879. Inflammatory attacks commenced in the right eye, which was now blind, two years ago. The left eye began in a similar manner, somewhat later. At the time of her coming to the Infirmary, the tension of the left eye was increased (+ T 1?); sight was impaired, though the exact visual acuity was not recorded. She had complained of pain at times, and had observed "coloured rings." The right eye possessed merely perception of light, and was occasionally painful. No operation on either eye was performed. On November 14th, eserine was prescribed. The vision in the left eye had become more affected (Jäger 16). The drops were prescribed at first for both eyes; but, in consequence of the pain in the head which they produced, their use was restricted afterwards to the left, then to the right, and lastly to the left again. The improvement of vision in the left eye is thus shown. On November 18th, she read Jäger 18; on November 21st, Jäger 4; on December 6th, Jäger No. 1; on March 26th, 1880, Jäger 2. Tension was normal. At this date, the eserine was entirely discontinued. On April 9th and July 9th, her condition was the same. On August 16th, she read Jäger 2 easily, or a newspaper. Twelve months later, she again came under my care for recurrence of pain, etc., in the right eye, which eserine had previously relieved. The condition of the left eye remained quite satisfactory.

The cases just related are evidence of the value of eserine in chronic glaucoma. They are recorded, not only because the results are excellent, but because the length of interval subsequently was enough to testify to the lasting effect. In both cases, moreover, I have reason to believe that, had any relapse occurred, the patients would have presented themselves at my clinique. I can recall several other cases, in which benefit has also accrued. I am aware that other observers have questioned the utility of this drug at all in chronic glaucoma; and, whilst my experience would lead me to differ from such an opinion, it compels me to admit that, in very many cases, its use is unattended with any benefit whatever. Here, however, operative

procedures—sclerotomy or iridectomy—do not produce such happy and brilliant results, as the latter operation so frequently does in acute glaucoma; and a little delay for a trial of this drug is not fraught with such terrible risks as in cases belonging to the acute class.

The following is an example, though not with such good visual results as the preceding ones, of the efficacy of the drug in permanently arresting the glaucomatous process.

Case 4.—John W., aged 58, came under my observation on July 6th, 1877. Vision in both eyes was seriously impaired. The right had gradually become so for a considerable time; while the left had been somewhat affected for twelve months, and was now becoming much worse. There had been no inflammatory attacks. With the right eye he saw fingers indistinctly; with the left he read Jäger 14. The tension of the right was $+T_2$; of the left $+T_2$. Both discs were cupped. On July 9th, the right eye was iridectomised. On July 31st, he read Jäger 20 with the right eye. On August 17th, the left read Jäger 16. Eserine drops were prescribed; the right eye read Jäger 18. On the 21st, the left eye read Jäger 10; tension was less. On the 24th, he made out some of Jäger 8. He said he had not noticed “coloured rings” so distinctly since he used the drops. November 20th. He still read Jäger 8. The eserine had been continued, except for an interval of a fortnight, until now; it was discontinued to-day on account of the conjunctival trouble it had occasioned. On March 5th, 1878, he had not used eserine since the last entry; vision was the same. On February 12th, 1882, I found the patient suffering from phthisis, and too ill to be examined; but he assured me that he did not think his eyes had become worse than when I saw him last, nearly four years ago.

Pilocarpine in Glaucoma.—In September, 1880, I was desired, one Sunday afternoon, to visit a lady aged about 70. I found her suffering from all the symptoms of acute glaucoma, which had apparently commenced the day before. Vision was reduced to little more than shadows. Tension = $+T_2$. There was violent pain. Iridectomy was declined. No eserine was easily procurable, and I therefore ordered the use of pilocarpine in the form of “discs” (Savory and Moore). In the evening, after the employment of the drug twice, she expressed herself as much relieved. A few days later, the attack had passed off, and vision was completely restored. This good result continued until the middle of January this year (1882), when she again came to me with another acute attack. She now consented to operation, and was iridectomised with a satisfactory issue.

I will merely add that, in other cases, I have noticed that

pilocarpine has been borne with comfort, where pain, after the use of eserine, has been complained of.

Eserine in Ocular Neuralgia.—The cases to which I refer, as those of ocular neuralgia, are characterised by severe pain in the eyeball and periocular region, and extending, it may be, over the brow in the course of the fifth nerve. There is always some hyperæmia of the ocular surface, and there may or may not be photophobia. In neither of the cases I relate presently did I satisfy myself of any increased ocular tension. The pain, in its darting, shooting, and periodical character, resembles neuralgia.

I am not yet able to satisfy myself as to the *modus operandi* of eserine in these cases; but its value in the two instances to be here recorded was unmistakable.

1. Some time since, a schoolmaster, aged about 35, consulted me under the following circumstances. He was suffering severe ocular and periocular pain, of a shooting and stabbing character—worse at some times than at others—and which for some days had rendered sleep well nigh impossible. There was some increased vascularity of the ocular surface. Vision was not affected, but effort with the eye was barely possible, and it brought on exacerbations of pain. He greatly feared that this was, as it were, the commencement of an attack similar to one he had suffered from some years previously, and which, notwithstanding a variety of treatment, had lasted for several weeks. Quinine, and then strychnine, were now prescribed without benefit. The sleepless nights and darting pains continued. He was next directed to place a gelatine disc of eserine, inside the lid, two or three times daily. The next day he came to tell me of the almost immediate relief he had experienced. A disc had been inserted in the afternoon, and another in the evening, and he had enjoyed a comfortable night. He was desired to continue the use of the eserine; and, though in a day or two he was perfectly well, he determined to have the discs near at hand should a return of the malady ensue.

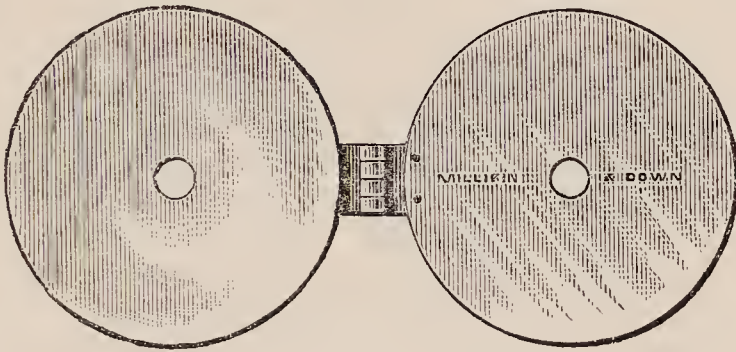
2. The next case, coming under my care shortly after the one just related, was that of a servant girl, aged about 21, sent to me by her mistress. In addition to the pain of the character and situation described in the foregoing case, there was more ocular congestion; the lids were tightly closed, and the photophobia had caused her to protect the eye with a bandage. Here the use of the eserine discs was directly prescribed, the result being equally successful—though the effect was not so immediate as in the previously recorded case.—*British Medical Journal*, June 3, 1882, p: 811.

73.—A WAISTCOAT-POCKET AURAL REFLECTOR AND SET OF SPECULA.

By E. CRESSWELL BABER, M.B.Lond., Surgeon to the Brighton and Sussex Throat and Ear Dispensary.

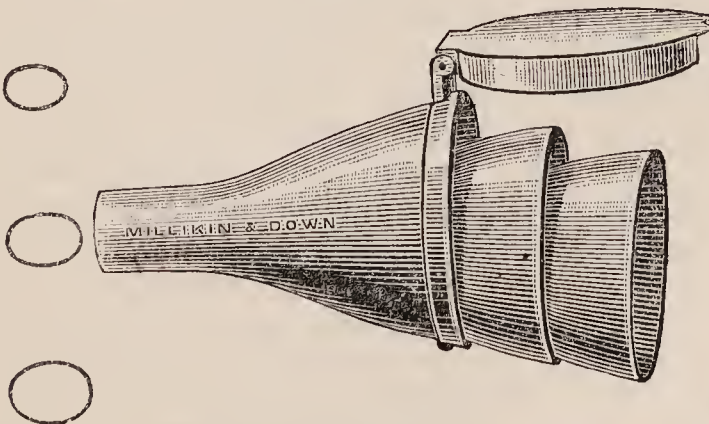
In comparison with some more favourably situated organs, such as the eye and the skin, the ear is placed at a disadvantage, inasmuch as it usually requires for the diagnosis even of its more common diseases the use of certain instruments. It is therefore of importance that these instruments should be made as simple and portable as possible. A great step in

FIG. 1.



advance in this direction was undoubtedly made when von Tröltsch introduced into general use the aural speculum and concave reflector, by means of which an ear can be inspected either with day light or artificial light. Under my direction Messrs. Millikin and Down of St. Thomas's-street, Borough, have modified these so as to render them still more portable. The reflector (Fig. 1, reduced in size) consists of two circular mirrors, each $2\frac{5}{8}$ inch (about $6\frac{1}{2}$ centimetres) in diameter, and

FIG. 2.



firmly jointed together at the edge, so that when folded their reflecting surfaces come into contact. One mirror is made of glass and is concave, having a focal length of $5\frac{1}{2}$ inches; the

other is nickel-plated and plane. Both have a central circular aperture. With the concave mirror the ear may be examined either with ordinary daylight or with artificial light, whilst with the plane mirror sunlight may be reflected into the ear. The focal length of the concave mirror is purposely made rather long in order that it may also serve for an examination of the nasal cavities from the front, and for throwing light into the fauces in inspecting that region. With this reflector and a bent hairpin to draw out the ala of the nose a very fair inspection of the nasal cavities can be made. The nest of specula (Fig. 2, natural size) consists of three, made of silver, fitting accurately one into the other. They are shorter than those in common use (measuring 3 centimetres— $1\frac{1}{8}$ in.—in length), and are made as light as possible. The smaller ends of the specula measure respectively about 6 by 7, 5 by 6, and 4 by 5 millimetres in diameter. The largest speculum, measuring at its broad end 17 by 18 millimetres in diameter, is fitted with a cap, which is preferably jointed on to the flatter side of the speculum, and not to the end of the oval, as shown in the figure. The shortness of the specula does not interfere, I have found, in any way with their practical utility, although, of course, they afford less leverage for moving them in the ear than the ordinary specula.

With these two small instruments in his pocket, the practitioner can, at a moment's notice, inspect an auditory canal and gain important information as to the state of a patient's ear. Others, no doubt, like myself, have frequently been requested to look at So-and-so's ear, as he or she was suffering from ear-ache or deafness. Instead of deferring one's examination to a future period, with these instruments at hand the auditory canal can be immediately examined, and the case prescribed for on rational principles. If, for instance, the meatus be occluded with cerumen, instillations of a solution of bicarbonate of soda can be ordered, which will facilitate its removal with the syringe at the next visit; if the meatus be filled with pus, directions can be given to syringe the ear with warm water; if the meatus be clear, and the membrane shows signs of acute inflammation, or of inflammation in the drum cavity, the immediate application of a leech in front of the tragus will probably be of great benefit, and any other instruments likely to be required, such as the Politzer bag or paracentesis needle, can be brought at a subsequent visit. Without multiplying instances, it is self-evident that, especially in acute cases, such as are met with in general practice, the earlier a case is examined the more successful and satisfactory the treatment is likely to be.—*Lancet*, Sept. 2, 1882, p. 349.

74.—TREATMENT OF CERTAIN INTRACTABLE FORMS OF PURULENT DISCHARGE FROM THE EAR.

By THOMAS BARR, M.D., Dispensary Surgeon for Ear Diseases, Western Infirmary, Glasgow.

In by far the greater number of cases of purulent discharge from the ear the source of the secretion is in some part of the middle ear.

In nearly all cases of chronic purulent disease of the middle ear, there is more or less destruction of the tympanic membrane. Through the opening thus formed, which may amount to only a pin point perforation, or to almost total destruction of the membrane, the purulent matter finds its way to the outer orifice of the ear.

Supposing that, as the result of preliminary treatment, the opening in the membrane is free from any polypoid or granulation growths, our next object is to reach the real source of the mischief in the upper and back part of the tympanum and antrum mastoideum.

Let me describe the various steps to be taken in carrying out the treatment which, I think, is the most efficient.

After syringing the ear in the ordinary way with a weak watery solution of carbolic acid, and thus washing away all secretion contained in the external auditory canal, the accessible parts are to be carefully and thoroughly dried by absorbent cotton, applied through a speculum. It is hardly necessary to state that all the manipulations here described must be effected while the interior of the ear is well illuminated by means of a concave reflecting mirror attached to the forehead. All moisture having been removed from the accessible parts, Siegle's pneumatic speculum is to be fitted air-tight into the external auditory canal, and suction employed with the mouth, or by an india-rubber ball. During the act of suction we shall generally see pus exuding from the parts above and behind. This pus, which has generally a very foetid odour, is then removed by means of absorbent cotton, and suction again employed in the same way until no more purulent secretion appears at the opening in the membrane. A little blood is sometimes drawn out of the congested vessels by the effect of the suction, but never in any great quantity, and should simply be wiped away.

We then proceed to cleanse away, as far as possible, any remaining purulent or caseous debris contained in the upper tympanic cavity and antrum mastoideum. This is done with a watery solution of carbolic acid, or of boracic acid, injected with a proper kind of syringe, which is used directly to the interior of the middle ear. I employ a middle-ear syringe, similar to one described by Hartmann in the *Deutsche Medi-*

cinische Wochenschrift, No. 44, 1879. This is a vulcanite syringe, capable of containing about two drachms of fluid, and having a short nozzle. To this nozzle is fixed, in a movable way, a fine silver canula, six centimetres in length, and having a lumen of one millimetre in diameter. The one end of the canula has a funnel-shaped opening, which fits accurately over the nozzle of the syringe. The other end, which is as small as possible, is bent at an obtuse angle, and is intended for introduction into the middle-ear through the perforation in the membrane. In order that the syringe and the hand of the operator may not obstruct the view, the canula has another bend in an opposite direction, near its attachment to the nozzle.

The canula may be connected with the nozzle of the syringe through the intervention of a small piece of india-rubber tubing. This arrangement prevents the force of the thumb in depressing the piston of the syringe being communicated to the silver tube, which force might propel its point upon the mucous membrane of the tympanum, causing pain, and probably injury.

When the sensitiveness of the parts is such that the hard metallic point of the tube cannot be tolerated by the patient, I make use of a piece of the small tympanic tube (*Paukenröhrchen*), introduced by Weber-Liel, for conveying fluid into the tympanum by the Eustachian catheter. This piece of the *Paukenröhrchen* should be six centimetres long, and should include the widened end which can be fitted on to the nozzle of the syringe. The material of which this tympanic tube is made, on account of its softness and elasticity, produces no irritation, but, on the other hand, these same qualities render it liable to be displaced from its position when the stream of liquid is forced through it.

Dr. Blake, of Boston, describes another form of middle-ear syringe in the *American Journal of Otology* for January, 1880. In his syringe the canula is fixed to the syringe by a screw, and when a medicated solution is to be employed Dr. Blake first removes the canula, and then screws a small glass tube on to the nozzle of the syringe. The medicated fluid is then drawn into the glass tube, to the outer end of which the fine canula is then screwed, and the injection used.

The solution of carbolic or boracic acid, after being warmed, is drawn into the syringe, the silver canula of which is then carefully passed through the speculum into the inner end of the external auditory canal. Its bent point, directed upwards, is cautiously placed in the aperture from which the pus was seen to exude. When the point of the canula is in proper position, the syringe being held between the index and middle

fingers of the right hand, the piston of the syringe is pressed slowly inwards with the thumb. If there is an india-rubber tube connecting the canula with the syringe, when the point of the canula is in position, its outer end is held between the thumb and index finger of the left hand, the latter being steadied by resting the remaining three fingers upon the side of the head. At first a stream of only feeble force should be used, and only one or two syringefuls injected at a sitting; afterwards, however, a stronger stream and four or five syringefuls may be injected with advantage.

There are great differences among patients in the degree of sensitiveness of the mucous membrane of the middle-ear to the touch of the instrument. Many seem to have little, if any, discomfort, while, on the other hand, a few are not able to tolerate the pressure of the metallic canula. Sometimes, slight giddiness is complained of, while the stream of fluid is passing upwards, but this is rarely severe, and after a few applications it is no longer experienced.

By the use of the syringe we often succeed in dislodging and bringing away considerable quantities of cheesy-looking masses. Generally, however, several sittings are necessary, at intervals of two or three days, before such material is brought away.

After taking these cleansing and disinfecting measures until we think the most of the purulent and caseous debris has been removed, some more powerful injection must be applied. Probably the best is a strong solution of nitrate of silver (30 grains to the oz. of water), ten drops of which, after being warmed, are injected by the middle-ear syringe and the elastic tube. Before this injection is used, and after the cleansing injection, the accessible parts must be carefully dried, and any of the liquid which remains in the concealed parts should be sucked out as far as possible by Siegle's speculum used as already described. The more thoroughly the mucous membrane intended to be treated is freed from all moisture, the better will be the therapeutic effect of the nitrate of silver. I have in some cases used a solution of sulphate of zinc, but I think the nitrate of silver is the more useful, although it is the more troublesome in consequence of the precautions necessary to prevent blackening the skin of the external auditory canal. After the use of the solution of nitrate of silver, the external auditory canal is mopped out with a warm solution of salt and the accessible parts again carefully dried. Lastly, if the perforation in the membrane is of some size, finely powdered boracic acid should be insufflated as recommended and described by Bezold in the *Archiv für Ohrenheilkunde*, Jan. 1879. While the powder is insufflated so as to cover the exposed part of the tympanic mucous membrane it is not to be tightly packed, in

case it should hinder the escape of the purulent matter from the deep parts. Applied in the way I have mentioned it forms an antiseptic covering, and keeps the parts dry for a time. The treatment which I have described ought to be repeated frequently at intervals of three days.

The following three cases were treated in the manner I have now described. Other cases have been treated by me in a similar way, and with good results. It will readily be understood, however, that where caries exists or where the seat of the discharge extends to the remote mastoid cells, we can succeed only in ameliorating the condition of the ear. These three cases had been treated at some time or other by aural specialists who had employed packed boracic acid, rectified spirits, iodoform, &c., to the exposed parts. They are thus clearly cases in which the improvement or cure was the effect of this mode of treatment.—*Glasgow Medical Journal*, May, 1882, p. 321.

MIDWIFERY, AND THE DISEASES OF WOMEN AND CHILDREN.

75.—ON THE CAUSES, RESULTS, AND TREATMENT OF LACERATIONS OF THE CERVIX UTERI.

By ANGUS MACDONALD, M.D., Physician for Diseases of Women,
Royal Infirmary, Edinburgh.

Delivery under normal circumstances even is constantly associated, in primiparæ at least, with more or less traumatism of the genital passage. The cervix uteri is never found, at the termination of the first stage of labour in a first case, to dilate sufficiently wide to admit the head and body of the child to pass. It is, indeed, to all appearance, deficient in tissue to enable it so to do. Consequently, on all such occasions, with a full-sized child, it is found to tear. The upper part of the vagina, also, frequently gives way, and still more frequently the lower. The perineal body is usually more or less lacerated, and often deeply and seriously so. The great bulk of these lacerations prove to be unimportant in themselves and transient in their results, but a certain proportion of them are serious and involve surgical interference to remove their evil effects. It has long been acknowledged that perineal injuries, when severe, require surgical interference. But whilst the plastic operation on the perinæum has been for long regarded as warrantable and necessary, the corresponding operation upon the cervix is only of very recent growth, and cannot be said to have as yet fully secured the acquiescence of British gynecologists.

I am far from disposed to unduly magnify the importance of this question, and the more so because we live in times when most thoughtful gynecologists cannot avoid feeling that a tendency to the too frequent application of surgical methods in dealing with women's diseases is widely, and not unfrequently disastrously, prevalent. But I should like to state that experience tends to lead me to the conviction, that at any rate as many women suffer from injuries of the cervix uteri of a character remediable by surgery as suffer from similar injuries of the perinæum, and that the plastic operation which has as its object the restoration of the cervix uteri to as near as possible its normal condition is equally as much warranted as the similar operation upon the perinæum. For the comfort, also, of hesi-

tating operators I am able to state that the operation on the cervix is the much more easily performed of the two, and is likely to be much more frequently successful.

I wish it to be understood that I am at present treating of injuries to the cervix and their results when of a minor degree. I state so in order to guard myself against being supposed to overlook or ignore those terrible lacerations that occasionally arise in connection with retarded or obstructed labour, and which, of course, fall under the management of the obstetrician at the period of delivery, and cannot come under the heading of gynecology in its more restricted sense. It has been urged to treat cervical lacerations at the moment of delivery; and although, judging from the changes of opinion that have taken place within the last ten or fifteen years in the direction of treating serious perineal tears at once, and not waiting to ascertain what nature's efforts unaided may effect, I am not indisposed, on theoretical grounds, to believe that ultimately such may come to be the acknowledged procedure, yet at the present time I have no experience of such operations, and do not feel warranted at present in recommending them. I prefer to wait to see whether such tears shall heal up so far as to be no essential barrier to the woman's enjoyment of life, and only recommend operative interference when unmistakable symptoms of distress and discomfort present themselves.

I mean to spend the remainder of this hour in showing you the nature of those cervical tears to which I have restricted myself, and the means by which I believe they may best be coped with. As the merits and demerits of the method of treatment of those lesions of the cervix known as Emmet's operation, and which you will perceive in the sequel I have adopted in the management of all the cases I lay before you, have been very much canvassed of late years among British gynecologists, it will, I think, conduce to let you understand my relation to the subject better if I submit to you a short reference in explanation of how I was led to adopt it.

In the summer of 1877 or 1879 I attended for some months a lady in Edinburgh whose husband belonged to America. This lady suffered from the results of deeply torn cervix, the consequence of an antecedent delivery. The body of the uterus was in a normal condition. There was no endometritis, no uterine tenderness, no ovarian disease, and no pelvic complication. But the cervix had been deeply cleft on both sides. It was much everted and greatly hypertrophied. The everted mucous membrane was, as is usual in those cases, much swollen, very vascular and reddened, presenting the appearances, in an aggravated degree, which were wont to be styled "ulceration of the cervix," a condition that I think has been tolerably clearly

proved to be no ulceration at all. The symptoms complained of in this patient's case were very great menorrhagia and consequent anæmia, with general enfeeblement, also leucorrhœa in the intermenstrual period. There was no dysmenorrhœa. I treated the case, according to my then knowledge, with local non-irritating astringents accompanied with general tonic treatment. But after some time I was sorry to see the patient leave town without, to my mind, being materially bettered by my help. I may be allowed to mention that during one of her menstrual periods the bleeding was so severe as to seriously threaten the life of my patient.

In the course of the autumn this lady visited Boston to see her husband's friends. I was gratified to learn, by a letter from her husband, that while there Emmet's operation had been performed upon her, and that it had been completely successful. There had been considerable weakening of the patient through loss of blood during the operation, but the menorrhagia had entirely ceased, and the patient had recovered good health. Of the truth of these statements I was able to satisfy myself nearly two years after the operation, when the patient called on me on her way to the Highlands, and I was further delighted to find matters exactly as represented.

Meanwhile reports of the operation, which had been introduced several years previously by Dr. Emmet for the cure of split cervix, became more general in the records of American gynæcological practice, and I resolved to avail myself of the first opportunity to test its value. This leads me to record briefly the cases, nine in number, in which I have operated, after which I will describe to you a case at present in the ward waiting operation, and on which I propose to perform Emmet's operation on Wednesday next, 7th instant, so that you may thereby have the advantage of watching its treatment from beginning to end.

Case 1.—Mrs. T., who had been in the habit of consulting me occasionally for years on account of backache, menorrhagia, leucorrhœa, and dysmenorrhœa, and who dated all her ills from her first and only confinement, happened to apply for advice about this time. Her labour had been difficult, I think instrumental. After getting tired of seeking help from her family doctor, she had applied to me. The pathological conditions which were associated with the above symptoms were as follows, viz., deep transverse tear of the vaginal portion of the cervix uteri, with much hypertrophy of the part, and ectropion of both anterior and posterior lips. The body and fundus of the uterus were normal. There was no ovarian or pelvic complication; yet the menorrhagia, leucorrhœa, and

backache were such as to occasion the patient much distress in the discharge of her various duties, which included, among other things, a great deal of standing in attending upon a shop. I had been able to relieve her from time to time greatly, but the symptoms returned with provoking persistency. I now suggested to her the new treatment, which I had reason to believe would be radical in its results. The patient at once assented to have it tried. Accordingly, after due preparatory treatment by hot douche, rest, etc., Emmet's operation was performed on her on the 8th of July 1879. In the management of this case I was assisted by Drs. Playfair and Jardine. The operation was completely successful, as every stitch adhered by first intention. For the first month or two some backache was complained of, but there was no more leucorrhœa or dysmenorrhœa, and in the course of three months all disagreeable symptoms had disappeared, and the patient became, and has ever remained, as she herself expresses it, "quite a new woman."

[Encouraged by this experience of Emmet's operation, Dr. Macdonald resolved henceforth to practise it in suitable cases, and continued to do so till interrupted by illness last July. After relating nine other cases equally interesting, he proceeds to remark:]

As to causation, doubtless these tears are primarily due to the accidents of delivery. They are probably more frequent on the left side of the cervix than on the right, as the occiput is more frequently to that side, and as right lateral obliquity of the uterus is much more common than left lateral obliquity of it, so that the uterine distending force inclines more to the left than to the right side. There is no reasonable doubt that tears occur anteriorly and posteriorly also. But, besides the fact that they are not usually so large nor so frequent, there is some reason to believe with Emmet that the anterior and posterior walls of the vagina do not compress the cervix at the sides so well as the lateral walls do the more central portions of it, so that while spontaneous healing occurs frequently when the tear is anteriorly or posteriorly, this seldom happens when the tears are lateral. But in many cases the cervix presents its hypertrophy with radiating sulci or tears, so that it cannot be said that all ruptures in the anterior and posterior lips do heal spontaneously. In my opinion ruptures are not found to give trouble so frequently in the anterior and posterior parts of the cervix, rather because in those situations they do not so frequently occur of a primarily deep nature than because they heal up so readily as has been supposed when they do occur. At any rate it is difficult to understand how the vaginal walls should act so differently in the antero-posterior

direction from the manner in which they are said to act in the lateral direction. But doubtless, also, other effects besides normal distention by the foetal head and body contribute to injuries of the cervix at delivery. Of course instruments occasionally do harm; but I dread more the injury resulting from the meddlesome application of obstetrical fingers in hurrying dilatation of a slow cervix, or in forcibly pushing the neck over the occiput during a pain. The practitioner is sadly tempted often to hasten delivery in this way; but if he duly regards the interests of his patient, I think he will almost always let the cervix alone. I further believe that in so doing he will seldom lose any time. Hurrying delivery by turning or otherwise, when the neck is imperfectly dilated, is apt to cause rupture of the cervix.

If, therefore, such effects follow tear of the vaginal portion of the cervix, how are we to obviate them? Various methods of treatment have been tried with more or less success. Amputation of the hypertrophied cervix has been often recommended and practised. This is, however, a very barbarous method, as it is found, when the rupture is healed, that the cervix gradually absorbs, and thus the hypertrophy disappears. The destruction of the abraded surface with some strong escharotic, such as fuming nitric acid, caustic potash, acid pernitrate of mercury, and even the actual cautery, have also been largely employed. They no doubt succeed in a large proportion of cases. The explanation is that the irritated, hypertrophied, and congested mucous membrane of the cervical canal which has become rolled out is destroyed entirely, along with more or less of the subjacent tissues. There results cicatrization of the subjacent surface and arrest of the symptoms which the inflamed mucous membrane caused, with more or less contraction and absorption of the cervix. But I put it to you, gentlemen, whether such treatment is not more properly called a mutilation. The mucous membrane which causes the abrasion is, on the whole, healthy mucous membrane, and when rolled in again gives no further trouble. Those reddened surfaces were long looked upon as superficial ulcers. The observations of Tyler Smith and others favoured this view. But those of Rugé and Veit, in the work already referred to, show that the surface is completely covered with cylindrical epithelium, and that the condition is of the nature of chronic irritation of the mucous membrane, with multiplication of its glandular, vascular, and connective tissue elements, and in no sense an ulceration or even a true abrasion. That being so, the method of treatment by application of lunar caustic, once so much in vogue, and even now too much practised, could only be injurious as increasing the irritation without destroying the irritated tissue or remov-

ing the cause of irritation. In very slight cases, doubtless, the application of caustic is useful, and many cases can be cured by the continuous use of the hot vaginal douche unaided by any other application. Without, however, taking up your time in detailing the methods of treatment that have or may be adopted, let me explain that which we have followed in the management of our cases.

It will, I think, be granted that, if the disease is mainly due to rupture and rolling out of the cervical mucous membrane, and to the irritation which results from the exposure of this mucous membrane, which is naturally bathed in an alkaline secretion, to the action of the acid vaginal secretions and to friction against the back wall of the vagina, the most natural treatment is, with Emmet, to roll the cervix back again into its natural form and secure it in that position by the necessary plastic arrangements. In this way all risk of the continued irritation of the mucous membrane is removed. But in order to secure these results certain rules of management must be followed.

1st, *The Preparatory Treatment*.—The patient is prepared for the operation by rest in bed, hot water douche, and other suitable treatment, to reduce the congestion of the parts and to subdue any intra-pelvic inflammation or irritation that may coexist. Of late it has been proposed to perform the operation in the face of certain acute pelvic inflammatory conditions, with a view to their benefit by the operation. But to this plan I am not prepared to subscribe. I always subdue such complications as thoroughly as possible before operating.

2, *Exposure and Fixation of the Cervix*.—To have the vaginal portion well under control during operation is a necessity of success. The cervix is exposed by Sims's speculum. The operation, if the uterus is fixed by adhesions, must be performed with the parts *in situ*. But if the uterus is free to move, much advantage is gained by depressing the cervix to the vulva, as there is then much more room for passing the needles. In either case the cervix needs to be fixed. This can be imperfectly done by hooks, but tolerably thoroughly by fixing a volsella in each lip, and either steadying the cervix or depressing the entire organ by pulling through them on the cervix. But hooks, and even volsellæ, readily lose their hold or are pulled through. It is better to follow the suggestion of Dr. Jackson of Chicago, and pass a thick thread through each lip, and then, tying each thread long, to form thereby a strong loop in each lip, by which the cervix may be controlled and the entire uterus depressed if practicable. By pulling both threads at once the two lips can be accurately approximated, and by pulling with one loop in one direction and with the other in

another the lips can be separated and held in any required position to facilitate paring the edges or passing or securing the sutures. A further improvement has been introduced by Dr. Goodell. This consists in using only one stout thread passed through both anterior and posterior lips, and then tied long so as to form a single loop. This thread is passed through the cervix in the mesial line of the body, and is thus a reliable guide at the end of the operation to where the external os should be, and in this respect is more trustworthy than the two loops. For the purpose of keeping the two lips apart the single loop is, if sufficiently long, as serviceable as two loops, since by pulling upon the part of the thread passing between the anterior and posterior lip the large single loop is easily converted into two smaller loops, which then can be manipulated singly.

3rd, Paring the Edges.—The cervix being exposed and steadied as already explained, the patient being placed in the half-side half-face position, or in the lithotomy position, and chloroformed, the next step is to raw the edges of the wound. In so doing the superabundant tissues of the hypertrophied cervix are to be removed if necessary, so as to admit of perfect coaptation without unduly straining the parts in the grasp of the stitches. This is absolutely necessary to secure success, as if the stitches drag too much there is almost certain to be failure of the operation. The stitches and rawing must be so arranged as to secure as near as possible the normal condition of the cervix, consequently near the base of the cervix the rawed surface must be broad and the sutures deep, whilst near the apex its rawed surface is thin and the stitches introduced shallow. In this way the cavity of the cervix is restored nearly to its original condition, and no cavity is left for accumulation of mucus, which would be the case if we contented ourselves with merely securing adhesion of the surface of the rent only. It is surely not necessary to remark that the parts that are to form the cervical canal remain untouched. In rawing, care is needed where the tear abuts upon the vagina, *i.e.*, at the base of the rupture. Here the tissues removed must be as superficial as possible, in case we should have troublesome hemorrhage through wounding the cervical artery. The edges may be pared by knife or by vaginal scissors. I prefer the latter usually, as less likely to be followed by bleeding, and also as more manageable as a rule.

4th, Arrest of Hemorrhage.—If the cervix is very much hypertrophied it is possible to apply some sort of tourniquet, such as Breisky's, which I now show you, round its base, and thereby secure a bloodless operation. But usually this is impracticable, and we endeavour to stop the bleeding by

application of ice or of a jet of hot water. It is rare that a vessel needs to be tied. But it will be seldom necessary to wait for the complete arrest of the oozing from the rawed surface: it completely stops when the stitches are tightened. The necessary precaution must be taken, at the moment of tightening the sutures, to clear out every particle of clot that may be situated between the edges of the wound.

5th, Passing the Sutures.—These are passed by means of short stout needles about $1\frac{1}{4}$ in. in length, and which are held in the grasp of a firm needle-holder. Each stitch should include, when tied, the entire depth of the rawed surface at that particular spot. Some trouble from want of room is experienced in passing the stitches when the operation is performed with the uterus *in situ*, but scarcely any if we can depress the organ sufficiently.

6th, Securing the Threads.—The two ends of each thread are now to be brought through a shield and secured by a twister. The twisted threads should be cut short, leaving only about half an inch or so, and then carefully bent by the aid of the needle-holder and a hook, so as to bring the twisted ends of the thread to lie parallel to the surface of the cervix, and thus not to wound the vagina. This is a most important arrangement, and is called by the Americans “kneeing” the sutures.

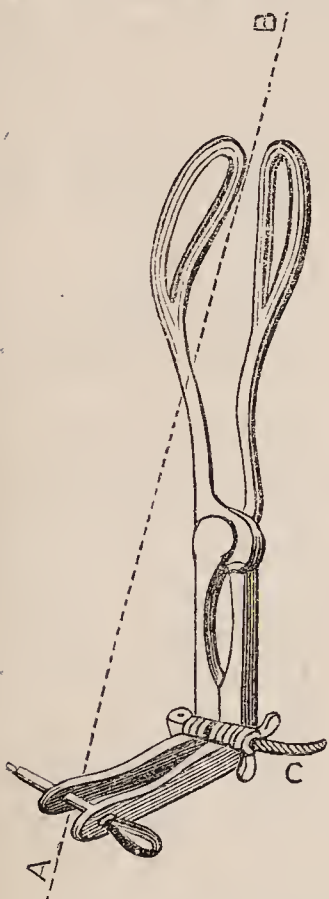
7th, After-Treatment.—The patient is put to bed and is kept scrupulously at rest for nine or ten days. She is not allowed to get up to make water or empty her bowels. But when you insist upon quiet, all that is required is done. The vagina is washed out with a disinfectant lotion once or twice daily, according to circumstances. The stitches are to be carefully removed about the tenth day. The patient should not be allowed to move about much for a week later. There is little pain experienced after the operation, and the patient, when lying in bed, feels quite comfortable.—*Edinburgh Medical Journal*, July, 1882, p. 1.

76.—ON A NEW INDICATING AXIS-TRACTION FORCEPS.
By A. DRUMMOND MACDONALD, M.B., C.M.Ed., Liverpool.

The leading points in the design of this instrument are—(1) axis-traction without the use of intra-vaginal rods; (2) indication of the grasp taken of the foetal head; (3) portability; and (4) minor deviations from the ordinary type of long forceps, partly suited to the three preceding points, partly by way of improvements. How this design is practically carried out is shown in the accompanying woodcut and following description.

Taking the parts *seriatim*: (a) The blades are $6\frac{5}{8}$ in. long,

$2\frac{7}{8}$ in. apart at the widest, and 1 in. apart at their extremities, which are not quite so broad as usual. When applied, and traction made, they will "give" half an inch, a point to be observed in all forceps, according to the temper of the steel, and having an important bearing on the question of grasp. The total breadth is $1\frac{3}{4}$ in., the fenestrum being $\frac{7}{8}$ in., leaving $\frac{7}{16}$ in. steel, which ensures a good hold. The fenestrated



lies in the lower portion of the blade and upper part of the shank, for the reason that when the blades are in apposition to the head, at or entering the pelvic brim, the natural curve of the genital canal lies below the head, consequently below the blades, and so corresponds to the curve above indicated. What we want is a pair of forceps acting as straight forceps, but without their perineal inconvenience, capable of being applied with facility, and at the same time adapted to the curve of the pelvic passages. (b) The shank measures $2\frac{5}{8}$ in. (with the blade $9\frac{1}{4}$ in.). This should prevent any locking in the vagina. (c) The lock is a kind of hybrid between the British and Continental locks, and allows of a scissors-action of the blades for the purpose of indication mentioned below. The lower blade has, and is easily recognised by, a hooked portion of the lock, on which the upper rounded and shielded segment is slipped in locking. (d) The handles have upper movable halves attached to the

lower by a hinge joint which admits of their being folded down from right angles, so as to be easier of manipulation when required, and occupy smaller space when not in use. There are holes for a transverse traction bar through their ends, between which is a space for the middle finger to be passed through when grasping this bar. (e) The indicator is seen as a scale on the flat convex side of the binding screw (c), passing through the centre of the hinge, and shows how far the extremities of the blades, when in position, are apart, within a range of one to three inches. This will indicate whether a sufficient grasp has been obtained to avoid risk of slipping; and if the exact presentation and movement be taken into account, will give an idea of the measurement of the diameter of the head we are dealing with. For portability's sake the traction-bar may be screwed into the head of the binding screw. (f) Mode of

application: The handle is not to be brought so far back towards the perineum as must be done with long forceps generally. Then having inserted the screw and read off its index number, raised the movable part of the handles, and placed in position the transverse bar, traction is to be commenced (assuming that the head is at the brim) with the bar opposite the tip of the coccyx, so that the line of traction (A B) shall pass through the axis of the brim. The hand is of course to be moved forwards as the head descends. The forceps are dark bronzed, to take away the formidable aspect that bright polished or plated instruments wear in the eyes of outsiders. Messrs. S. Maw, Son, and Thompson have given me a ready assistance in carrying out my endeavour to produce an "instrument of precision."—*Lancet*, July 29, 1882, p. 139.

77.—OIL OF EUCALYPTUS IN MIDWIFERY PRACTICE.

By SAMUEL SLOAN, M.D., Obstetric Physician to the Glasgow Maternity Hospital, &c.

When at the meeting of the Clinical Society of London on the 13th of May, 1881, Mr. Lister recommended oil of eucalyptus as a substitute for carbolic acid where the latter was inadmissible, it occurred to me that this substitute might be more extensively employed in obstetric practice than had been considered safe with carbolic acid. Since then I have put it to the test, and its advantages I have found to be the following:—1st. It is non-poisonous. 2nd. In the quantity and strength required it is unirritating. 3rd. It does not coagulate the lochia, which, by separating the lips of the vulva, can be seen to flow out in a liquid stream. 4th. Its odour is, with rare exceptions, a pleasant one. 5th. It seems to act as a uterine stimulant, causing and assisting to maintain uterine contraction. Formed into a pessary of a suitable shape and size it is easily applied to the neighbourhood of the os, and retained there. To secure this, the pessary must be broad and short, must melt slowly but completely, and must contain a large percentage of the antiseptic oil. These requisites I have found the following formula to supply:—Oil of eucalyptus, six drachms; white wax, four drachms; cocoa butter, four drachms; mix and divide into twelve pessaries. One of these must be applied night and morning immediately after the usual sponging, and, though the napkins are frequently changed, the odour will be quite perceptible on the one removed prior to the next sponging twelve hours later. In cases of miscarriage, or when the lochia has diminished materially in quantity—say, six days after confinement—I have found the above strength produce irritation, and the following will then be found prefer-

able:—Oil of eucalyptus, four drachms; white wax, 160 gr.; cocoa butter, four drachms; divide this mixture into twelve pessaries, and label them No. 2. These also may be used at first night and morning, and afterwards at night only. I show you these pessaries; they are made by first melting together the wax and cocoa butter in a vessel resting in hot water; the oil of eucalyptus is then mixed with this, and the fluid poured into the ordinary two-drachm pessary mould, each cavity being somewhat more than half filled. I have never been able to satisfy myself that the eucalyptus was absorbed into the system to any material extent. This is probable, however, and, in one case, seemed to be proved. This was a case of severely ruptured perineum, which was stitched and united throughout. The pessaries had been continued for sixteen days, when an erythematous rash appeared over the whole body, disappearing immediately on the cessation of the eucalyptic treatment. Though uncertain as to the fact of a material absorption of the oil into the system, I am persuaded that the oil does not remain at the os, but freely passes into the cavity of the uterus. For it is admitted that the uterus for several days after labour is naturally in an alternate state of contraction and relaxation, and whilst during contraction it will empty itself, during relaxation again whatever is lying at the os or upper part of the vagina will be sucked into the vacuum produced. The eucalyptus will therefore find its way quite into the uterine cavity. When I said that, with rare exceptions, the odour is agreeable, I referred to a decomposition of the eucalyptus oil which sometimes takes place, giving the napkin a semi-fetid odour. That this does not arise from a change in the lochia I have proved by simply omitting the next pessary when due; I then found that the lochia was absolutely sweet.

When I began a year ago to use this antiseptic in hospital practice, I ordered the pessaries to be used only for those patients who, from the nature of their labour or other cause, were likely to give trouble; and to those patients whose lochia had become offensive or whose recoveries were interrupted. In the case of the former the pessaries were begun immediately after labour; in the latter on the appearance of bad symptoms. In the former the result was invariably satisfactory; in the latter the treatment was a recognised aid to other measures. It was soon noticed, however, that the cases in which the labour was easy and natural gave afterwards considerable anxiety, usually from unrecognised mental distress, perhaps increased by the receipt of unwelcome news. I soon therefore saw the necessity for beginning the antiseptic pessaries immediately after labour in the case of all the patients. The consequence was that whereas offensive lochial discharge

had been no rarity—and when once this appeared in one patient it rapidly spread to others—fetid lochia was almost entirely banished ; the only case of undoubtedly putrid lochia having arisen from extensive superficial gangrene of the vagina, after a severe labour completed by the forceps. This woman, moreover, made a rapid and complete recovery. In some of the cases an offensive odour was suspected, but this had generally vanished when the next napkin was removed ; or, if it persisted, was found to have arisen from the fact that the pessaries had been for a considerable time in the hospital, having thus lost part of their volatile oil. They ought therefore to be made as far as possible just as they are required, since they will change after a few days. During this period one of the patients had severe ascites, from which she died. There had been a history of disease, the exact nature of which could not be ascertained, but hepatic disease was supposed to be the cause of the ascites. About seventy ounces of fluid were removed by tapping. This fluid was absolutely sweet when removed, and it remained so for days after, making it exceedingly probable that there was no septic element in the peritoneal condition.

In private practice, where the class of patients is of a more hopeful nature, I have restricted the use of the pessaries to the cases requiring special treatment from the beginning of the puerperal state. Amongst these were the following :—A case of inversion which I was not called to till several hours after its occurrence ; a case of premature labour following acute bronchitis in which the patient was almost in a state of collapse ; a case of subacute phthisis ; cases requiring operative treatment and with dangerous complications. These cases all did extremely well. In only one of them—the case of phthisis—was there at any time an offensive discharge, and this was in the second week, and forty-eight hours after the last pessary had been introduced. I should mention that it is now the practice at this hospital, as a special precaution, to use carbolic vaginal injections night and morning just before the introduction of the medicated pessary. In my private practice, however, the usual night and morning carbolic sponging alone preceded the use of the eucalyptus.

Regarding the use of eucalyptus as a curative in pyæmia, I have fortunately only one case to bring before you. In relating it I shall confine myself to the main points of the case.

Mary Anne M—— was admitted and delivered on Nov. 22, 1881. Her labour was easy and normal. Beyond a “scared” look, and the fact that this was her third (?) illegitimate child,

the case presented nothing unusual. The temperature rose, however, on the fourth day, and continued high. For some time there was nothing to account for the fever, there being no abdominal distention or tenderness till later on, and the discharge remaining sweet throughout the entire illness. No pessaries were used till the fever had set in. The patient steadily becoming worse, was, at an early stage of her illness removed to another ward, which was set apart for herself and her nurse. It was not till the third week that the true nature of the disease was apparent. At this time several parts of the limbs became swollen, whilst later on a large fluctuating swelling appeared on the back of the chest. The treatment consisted at first mainly of large doses of quinine with aconite and a liberal amount of stimulants. Later on eucalyptus was given internally by the mouth and by the rectum. By the twentieth day it was perfectly evident that the patient was sinking, and that a few hours would see the end. Determined not to leave anything undone, I now ordered hypodermic injections every hour of a mixture composed of oil of eucalyptus, five minims, and olive oil, twenty minims. I had found that one part of eucalyptus to two parts of olive oil could be borne without irritation by a granulating perineum, and I thought one to four a safe strength to start with for hypodermic injection. This producing little or no irritation, the quantity was gradually increased to eight minims of eucalyptus to sixteen of olive oil. It was soon evident that the patient was rallying; but as she improved, the irritation produced by the injections became so great that the resulting swellings could not be distinguished from those arising from the disease. The injections were now diminished in frequency, and finally, on the fourth day, abandoned. Soon the patient began again steadily to lose ground, rallying again on the resumption of the hypodermic injections. For a considerable time she seemed to hang between life and death, but under the generous care of the matron and the house-surgeon she gradually improved, leaving at last for the Town's Hospital with abscess of the left knee only, all the other swellings having slowly disappeared. There the knee was opened, and the case made most satisfactory progress. The woman called on me a few weeks ago. Her general health was then excellent, and beyond a slight limp she bore no traces of her illness.

From one case it would be unwise to draw positive conclusions as to the benefit of the eucalyptus used hypodermically as a cure for pyæmia, but I think I am justified in recommending that, under similar circumstances, it should be tried.—*Lancet*, Sept. 2, 1882, p. 343.

78.—DR. VEDELER ON DISPLACEMENTS OF THE UTERUS.

By the EDITOR OF THE LANCET.

In the last number of the *Archiv für Gynäkologie* is a contribution by Dr. Vedeler, of Christiania, on Displacements of the Uterus, in which the author brings forth evidence on a large scale, which must contribute materially to the formation of an accurate estimate of the part taken by such conditions in the production of symptoms. Dr. Vedeler has examined not only women who complained of pelvic troubles, but women who appeared, and stated themselves to be, perfectly healthy, and in whom no disease could be found. All women who complained of pelvic trouble, or in whom erosion, perimetritis, or tenderness around the uterus was discovered, were classed among the sick. The total number examined was 3012; of these, 18 suffered from prolapsus, and will not be further referred to. Of the remainder, in 15 per cent. the uterus was in the so-called normal position, in 12 per cent. it was anteverted, in 10 per cent. retroverted, in 54 per cent. anteflexed, and in 8 per cent. retroflexed. So that of 3012 women of the menstrual age, and of all conditions, single, married, &c., anteflexion was present in more than half the whole number. Again, 466 of the number were virgins, 749 nulliparous, 322 were from two to three months pregnant, and 1465 mothers.

Of the 466 virgins, 52 were suffering, and 414 enjoyed good health. The percentage of those in whom the uterus was found in the various positions which it may assume was much the same in the healthy as in the suffering; but it is curious and important to note that the so-called normal position was met with in only 7 per cent. of the healthy, while it was found in 6 per cent of the complaining; anteflexion, however, was found in 71 per cent. of the healthy, and in 70 per cent. of the ailing.

In healthy nulliparous women, the normal position was found in 9 per cent. only, and anteflexion in 71 per cent.; in nulliparous women who complained of pelvic symptoms, the normal position was found in 15 per cent. and anteflexion in 56 per cent. only. Here the normal position obtained considerably more frequently, and anteflexion considerably less frequently, in the diseased than in the healthy state. Anteflexion of the uterus was found in 68 per cent. of all single and nulliparous women—the total number examined being 1215. This is a higher estimate than that of some other authors; the mean estimate of seven observers (431 cases observed) being 43, while

Herman's estimate is 48 per cent. (111 cases examined). The number examined by Vedeler, however, is so large that his results are probably less liable to accidental error.

In those who were mothers the percentages of the various positions were somewhat altered, the normal position being met with in 22 per cent., and ante flexion in 37 per cent. of the healthy, while in the ailing the normal position was found in 23 per cent. and ante flexion in 38 per cent. In early pregnancy ante flexion was met with in 80 per cent. of the cases.

The data supplied by Dr. Vedeler are the largest hitherto collected, and they embrace all conditions of adult women. They have a most important bearing upon a question which has for a long time excited the attention of general physicians as well as gynæcologists, and cannot fail of having considerable weight in future discussions of flexions of the uterus and their place in uterine pathology. Besides the magnitude of the figures there are other features appertaining to these data which should be kept in view.

The women examined were not all subject to uterine troubles, but a very large number of virgin and nulliparous subjects examined were in the enjoyment of good health, and made no complaint of symptoms attributable to the pelvic organs. The total number of single and nulliparous women was 1215, and 920 of them had no uterine suffering. This fact gives the work of Dr. Vedeler the highest value; it helps us to discover the most usual position assumed by the uterus in a healthy state of the pelvis, and, together with the other data contained in the paper, it places the subject upon a firm and scientific basis. In about 75 per cent. of healthy women who have not had children, the uterus is in a state of anteversion or ante flexion, while a similar position of the organ is found in 70 per cent. of such women who complain of uterine suffering; and the so-called normal position is found in 8 per cent. only of such women in health, but is found in 13 per cent. when they suffer from uterine disease. Again, the highest proportion of cases of the so-called normal position is found in those who have had children, as well as the lowest proportion of ante flexion. Both conditions are, however, met with almost exactly the same frequency in disease as in health. It is further found in virgins, nulliparæ, and mothers, that although child-bearing has an influence on the position of the uterus, yet the frequency with which any given position of the uterus occurs in health is so nearly the same as the frequency with which it is met with in disease, that it is not possible to charge so-called displacements with being the cause of any symptoms.—*Lancet*, June 24, 1882, p. 1043.

79.—TWO CASES OF NON-CAPSULATED FIBROIDS,
RESEMBLING PLACENTA.

By JAMES BRAITHWAITE, M.D.Lond., Lecturer on Diseases of Women and Children at the Leeds School of Medicine, &c., &c.

The following cases show that non-capsulated fibroids of the interior of the uterus may so closely resemble placenta in the feeling communicated to the finger as to actually lead to the supposition that some placental mass or a portion of an ovum is retained in the uterus. This fact seems to me not a mere matter of curiosity only but of practical interest.

Mrs. L——, on the tenth day after delivery, commenced unexpectedly to lose blood. Dr. Green, of Leeds, her medical attendant, found on examination what he took to be a mass of placenta within the uterus, although at the time of delivery the placenta had come away entire. He succeeded in separating a considerable portion of this mass from the anterior wall. I saw the case with him at this point, and also at first took the mass to be placenta. It was jagged and even fringed on the free surface, and, judging from this surface alone, hardly a doubt would have crossed the mind but that it was true placental tissue. In this, however, alone consisted the resemblance, for the growth was of much firmer consistence than placenta, and was in its deeper parts an integral portion of the uterine wall, from which it could only be detached by a considerable degree of force. I therefore, as had Dr. Green, thought the growth might be malignant, and, but for its tough fibrous nature, rendering it impossible to tear or break it down except in the direction of the long axis of the uterus, should have had no doubt on this point. I continued the separation of the growth with some difficulty nearly to the fundus, but finding that it could not be shelled out, owing to the absence of any boundary between it and the uterine structure proper, and that I was getting deeper into the wall of the organ, I was obliged to desist, and then by means of long curved scissors removed the whole of the separated mass—not, however, in one piece, but in detached portions. I heard from Dr. Green that the patient made an uninterrupted recovery, probably thanks to the care taken to prevent septicæmia. Dr. Barrs, of the Leeds Infirmary, kindly made for me a section of the growth for the microscope, and I forwarded this to Dr. Galabin, who reported upon it as follows:

“The tissue seems to me to resemble what I have sometimes seen in soft, rapidly-growing, non-encapsuled fibroids—large muscular fibres, very large vascular spaces, tissue highly nucleated in parts, and round the vessels something approximating to the character of sarcoma. Some of the vessels show the

proliferation of the inner coat filling up the lumen which occurs in the uterine tissues of placental site after delivery. I should say there is no evidence of cancer, but that there may be a possibility of recurrence."

Case 2.—Mrs. H—, of Gildersome, near Leeds, had a miscarriage at three months; the ovum came away with great rapidity and entire. Four days afterwards Dr. Steele, of Morley, examined her in consequence of hemorrhage, and he found what he took to be a second ovum. I saw her with him the same evening, and found that the uterus contained a ragged, fringed mass, exactly resembling an ovum. I could not separate this from the uterine wall with the blunt scoop, which I generally use for this purpose instead of an ovum forceps, but succeeded in removing a small portion for examination. Next day I cleared out the whole, the cervix being fairly dilated by tents left in overnight. The mass did not separate like an ovum would have done, but required to be seized—a portion at a time—by interlocking ring forceps of some strength and crushed.

On microscopic examination it was found to consist of very loose fibroid tissue. Nothing at all resembling cellular growth could be detected. On adding a drop of strong acetic acid the fibroid tissue swelled and became almost invisible, but immense numbers of fungoid growths were then seen, not being affected by the acid. They were distinctly circular, not in chains like micrococci, and had evidently grown on stalks like ordinary fungus, for three of them were seen so growing from the same spot on a fibre not quite destroyed by the acid, the stalks diverging from the common point of attachment. They varied a little in size, but were about one twentieth of that of a blood corpuscle. No doubt they had been originally introduced from without, probably directly from the vagina, but their vast number, and the manner in which the whole mass was penetrated with them, shows the rapidity of their growth. This, however, is a point more of curiosity than practical moment, that to which I wish to draw attention being the almost exact physical resemblance which the growth as a whole bore to a retained ovum, and it is also worth noting that in both these cases the growth had its origin in the placental site, but nevertheless contained no placental tissue.

Dr. EDIS remarked that the case was one of great interest, and worthy of remembrance in more ways than one. A practitioner might readily incur unjust blame for leaving a portion of placenta in some case where secondary hemorrhage occurred. He (Dr. EDIS) had recently been consulted in a somewhat similar case where a patient miscarried at the fourth month, severe hemorrhage ensuing subsequently, and continu-

ing for several days. On examination a dense rough mass was found projecting from the posterior wall of the uterus, about the size of an hen's egg. On endeavouring to detach it the growth was found to be firmly encapsuled in the tissue of the uterus, being, in fact, a submucous fibroid, and not the placenta as was at first suspected. In a case similar to Dr. Braithwaite's, the exhibition of ergot would fail in arresting hemorrhage. The knowledge that such a condition was even occasionally met with might prove a valuable suggestion as to the line of treatment to be adopted.

Dr. HERMAN mentioned a case which had been under his care in the London hospital, in which there was a large abdominal tumour, shown by autopsy to be malignant. The uterus was enlarged, its cervix dilated, and in its cavity there was a growth of loose stringy texture. In this case the patient had, when she first felt the tumour, thought herself pregnant, and a medical man engaged to attend her, and sent for on account of hemorrhage, feeling through the patulous cervix the loose thready tissue referred to, took the case for one of placenta prævia. Several obstetricians of eminence subsequently saw the patient; and so closely did the mass presenting at the os resemble to the touch placenta, that the view above mentioned was admitted as a possibility by each one of them.

* Dr. ROPER had had under his care the patient whose case had been mentioned by Dr. Herman. Aged twenty-eight, she had been married six years, believed herself to be pregnant for the first time, and had engaged a medical man of great experience to attend her in her expected confinement. Her history in all respects was like that of pregnancy, and her general health was good. At the seventh month she was seized with a severe flooding, then a slight oozing for a few days, succeeded by another flooding. The case was supposed to be one of placenta prævia; her medical attendant sent for Dr. Roper in the middle of the night. The abdomen, both in shape and size, was like that of pregnancy at seven months. The os uteri admitted two fingers, and through it he could feel a mass like placenta. It was too rigid to allow of the passage of more than two fingers. The foetal heart could not be heard, but there was a loud bruit in each iliac region, and along the linea alba, and towards the umbilicus it assumed a musical tone. Labour did not come on. From time to time she had slight floodings, but remained in good health. Fourteen months after the date of supposed pregnancy she was taken into the Royal Hospital, Waterloo Road, where she was seen by Dr. Barnes and Dr. John Williams. A portion of the mass was removed with polypus forceps, but on microscopical examination no placental structure could be observed. At this time the os uteri was of the same size as at

first, and the mass could be felt. She subsequently came under Dr. Herman's care at the London Hospital, where she died rather suddenly of septicæmia. On post-mortem examination the case was found to be one of soft medullary cancer. This seemed to have commenced outside the uterus, to have invaded the uterine wall, and a portion projected into the uterine cavity. The uterus itself was about five or six inches in length, and its walls at the part not affected by the disease were much thickened.

Dr. HEYWOOD SMITH did not consider that the intra-uterine growths described quite answered to the ordinary characteristics of fibroids—the irregularity and tendency to break down of their surface was not like that of fibrous tumours; and, having regard to Dr. Galabin's observation that they were liable to recur, he ventured to remark that he believed these growths presented a feature more resembling some morbid tissue, than as a malignant growth, for true fibroids, though fresh ones might be developed, did not recur. He would like to know on what grounds they were supposed to be fibroids at all.

Dr. FANCOURT BARNES had distinctly heard the sound called placental souffle in Dr. Roper's case. He should like to hear some explanation of these sounds.—*Obstetrical Transactions*, vol. xxii., 1882, p. 182.

80.—EXCISION OF UTERUS BY ABDOMINAL SECTION.

By ANDREW CLARK, Esq., F.R.C.S., Assistant-Surgeon to the Middlesex Hospital.

On the 29th September last there was admitted into the hospital L. D—, a thin, care-worn Pole, forty-two years of age, and understanding very little English. On this account a good deal of difficulty was experienced in eliciting the particulars of her case. She came because of a rapidly increasing abdominal enlargement, and gave the following history. Had been married twenty-two years; had never been pregnant; catamenia regular from the time they commenced, the date of which she does not remember, until three years after marriage, when they ceased altogether for nine or ten years; they then recommenced, and have been quite regular ever since. She has never had an attack of menorrhagia, and can give no reason for the cessation and commencement of the menses. She has not been a strong woman, but has never been laid up with any illness, excepting five years ago, when she was for a short time in the London Hospital for a pain in her left side, with some slight enlargement in the iliac region. The pain was cured, but the lump remained, giving her little or no trouble. She can give us no information as to her family history. With regard

to her present illness, she says that in January of last year she observed her abdomen was increasing in size, and since July the increase had been more rapid; it was unattended with pain till a few weeks ago, but lately she had been subject to occasional attacks of pain in her left side. The size and weight of the abdomen rendered her life miserable and prevented her moving about; she therefore sought medical advice.

State on Admission.—Abdomen presents a globular tumour projecting forwards, having the appearance of a uterus containing a foetus at nearly full term, rather more prominent on left side than right, and as patient lies on her back considerable bulging of left flank. The skin is stretched and tense all over the belly, but the umbilicus is normal. There is no tenderness except in the left iliac region. Tumour smooth, yielding, and elastic. No wave of fluid can be felt from one side of abdomen to the other, but there is fluctuation to be felt here and there about the tumour. The whole tumour can be moved freely in the belly, and the highest part is about two inches from the sternum. The percussion note on the front of the abdomen is uniformly dull up to the top of the tumour, the dulness extending laterally on each side rather beyond a line drawn vertically upwards from the iliac crest to the twelfth rib. Both flanks are tympanitic; the extent of the area of resonance depends on the position of the patient, but in any position the note in the extreme flanks is perfectly clear. Girth of abdomen at umbilicus thirty-four inches. Vaginal examination: Os uteri soft, and in normal position, tumour moves with uterus and appears to be part of it; uterine sound goes in a quarter of an inch beyond normal distance, giving a good deal of pain. Putting the patient on the right side and examining with the left hand the tumour appears to be isolated from the uterus.

A note made on Oct. 17 says there is no material change except that the size of the abdomen has increased to thirty-six inches and a half at the umbilicus; menses ceased to-day. Area of dulness found very variable, rarely two days alike. Patient's general appearance has improved, she is stouter and in better spirits, the condition of urine normal, and all the functions of the body properly performed. I took the case to be one of ovarian tumour more or less solid, and decided on removing it by abdominal section, particularly, as owing to the ease with which it could be moved in the abdomen, and there being no history of previous attacks of peritonitis, I believed it to be free from adhesions.

Accordingly, at 9 a.m. on October 24th, the carbolic spray being used, the patient was anæstheticised with a mixture of chloroform and ether, and a small incision made in the middle line to expose the tumour. A trocar was introduced and

nothing but blood came out; the incision was then extended upwards above the umbilicus, and downwards to the length of nine inches. The bleeding in the abdominal wall, which was very little, was stopped by the application of the torsi-pressure forceps, and the tumour being quite free from adhesions was easily drawn out of the wound. It turned out to be a solid tumour of the uterus. There were a few small cysts in the left ovary, and the right was quite normal. I separated the ovaries and removed them after tying their pedicles with carbolised silk, and returning them; a clamp was then put upon the neck of the uterus, and it was cut off with a scalpel about an inch above. The peritoneal cavity was then carefully cleansed with warm carbolised sponges (at this point in the operation the steam spray ceased to act), and the edges of the wound brought accurately together with seven deep and two superficial silk sutures, the pedicle being fixed immediately above the pubes, which was easily done without any undue dragging; the incision was dressed with boracic charpie and carbolised gauze, and the stump covered with lint dipped in carbolised oil. The patient was then tightly bound with a flannel bandage and removed to bed, having been under anæsthesia one hour and forty minutes. I saw her about two o'clock and found her very comfortable. She had recently complained of a little pain, but obtained relief after the catheter had been passed and about three ounces of urine drawn off. A note made at 9 p.m. says the patient is perspiring freely, has vomited two ounces of clear fluid, and has had a little pain in the abdomen. Temperature 99.8° . Ordered an enema with fifteen minims of sedative solution of opium. Next morning I found patient very comfortable, having slept three hours during the night after a second enema; had vomited two ounces; catheter passed once, and five ounces of urine removed.—26th (third day): Continues in a most satisfactory condition; ordered small quantities of jelly beef-tea, cold. Wound dressed to-day under the spray in the same manner as at the operation.—27th: Dressed to day; one deep and one superficial stitch removed, and stump dusted with persulphate of iron; consumed three ounces of beef-tea in the last twenty-four hours.—28th: Slight discharge noticed to-day from the vagina; three more stitches removed at the dressing; doing well.—29th (sixth day): Complained of a sharp pain at 7.30 this morning; temperature then 96.8° . This soon passed off and she seemed all right till about half-past twelve, when it returned. I saw her soon after one, and found her in a profuse perspiration, and apparently in pain. She complained of a burning sensation in the region of the wound, and I found some blood oozing from beneath the bandage. I immediately removed all the dressing under the

spray, and observed protruding from the wound a greenish-black substance which looked like gangrenous bowel, but on investigation it proved to be a clot. This was carefully removed, but fresh blood oozed up in its place, and the manipulation causing a good deal of suffering, she was again anæsthetised, and the whole wound had to be opened up before the bleeding could be stopped. It was found to come from several small vessels in the abdominal wall; these were tied, and some blood being seen in the pelvis, I deemed it prudent to be quite certain that no blood came from there. Finding all secure, I carefully sponged out the pelvis, as at the operation, with soft carbolised sponges, and brought the edges together again with deep and superficial sutures, applying the same dressings as before. A subcutaneous injection of one-third of a grain of morphia was administered. A note made at 9 p.m. says: Patient expresses herself as very comfortable, and seems none the worse for what has taken place; she begs for something to eat and drink, but is only allowed ice.—30th: Very comfortable; complains of hunger. Ordered jelly beef-tea in small quantities.—31st: Still complains of hunger, and has become very restless on account of it. Ordered milk as well as the beef-tea. This produced vomiting, which seemed to do her no harm, and she begged for more, so it was given to her. She has had seventeen ounces of milk and four ounces of beef-tea during the past twelve hours.

Nov. 1st: Has been very restless during the night, and not quieted by two hypodermic injections of one-third of a grain of morphia; craving for more to eat. Ordered rusks and milk. Wound looking well; one superficial stitch removed; has been dressed daily.—2nd: Had an enema to-day followed by a copious evacuation. Pedicle now beginning to be offensive; carbolic oil painted over and applied on lint round it; two more stitches removed.—3rd: Expresses herself as feeling better; retches sometimes, but does not vomit. We may pass over a few days and note—6th: Had a breast of chicken to-day and enjoyed it; pedicle being very offensive dressed with iodoform and vaseline; all the stitches but two now removed. Sleeps well, and is in no pain.—7th (fifteenth day): At the dressing to-day clamp found to be loose; removed with the stump. At 10 p.m., eight hours after removal, slight retraction of pedicle noticed. Patient's only complaint is hunger, though she is allowed to eat as much as she likes.—10th: Continues to improve; has had a draught of compound senna followed by a copious evacuation. The pedicle is still retracting, and there is a good deal of discharge of laudable pus.—13th: Last suture removed to-day; doing well.—15th: The stump still discharging a good deal of laudable pus; does not seem to have retracted for

the last three days. Passed her urine to-day for the first time without use of catheter. Now ordered to be removed to general ward; and from this date continued to progress favourably, and left the hospital for a convalescent institution early in December, six weeks after the operation.

Such, gentlemen, is the history of the case; it is interesting and instructive in several particulars; and I wish to direct your attention to the diagnosis, the operation, the treatment of the pedicle, and the secondary hemorrhage.

As regards the diagnosis, I dwell on this partly because there is no class of disease in which the diagnosis may be more difficult than in abdominal enlargements, though the nature of some tumours may be readily determined, and partly because all of you when you get into practice, though you may not have to perform the operation of ovariectomy or hysterectomy, will certainly be called upon to give your verdict as to the nature of an abdominal enlargement, and you must not mistake a phantom tumour for ascites, or pregnancy for an ovarian cyst. I dare say some of you are thinking such mistakes are impossible, and no doubt such as I have mentioned are, if ordinary care is used, in by far the majority of cases; but there are instances where careful and experienced surgeons have attempted the operation of ovariectomy and found they were dealing with a pregnant uterus, and there are constantly recurring examples in which chloroform has to be administered, and perhaps an exploratory incision made before the diagnosis is ventured on. In the present case my diagnosis was wrong; but, with the history and condition of the patient, I still think I was warranted in coming to the conclusion I did—viz., that I had to deal with a nearly solid ovarian tumour free from adhesions.

Let us now consider the signs and symptoms in this case, and by a process of exclusion get at our diagnosis. And first, we should decide whether we have an actual tumour to deal with, or whether the enlargement is due to ascites, tympanites, or a simple deposition of fat. Firstly, inspection. In either of the three conditions just named the enlargement is more symmetrical; the flanks are distended as well as the front. In ascites the superficial veins are enlarged, and the umbilicus more or less obliterated. In obesity other parts of the body would probably be found loaded with fat; the skin can be pinched up in folds, and on the patient sitting up the belly rolls down on itself towards the pubes. Secondly, manipulation. We note carefully the position of dulness on percussion; in ascites this will be found in both flanks when the patient is lying on her back, and the dull area will alter with the movements of the patient, the resonant parts always being highest. In obesity we find a

difficulty in discovering any very resonant part, owing to the thickness of the abdominal wall, and in phantom tumour resonance is found all over the belly, and sometimes, by kneading the parts and taking off the patient's attention, it can be made to disappear; the administration of chloroform will always effect this. Fluctuation is absent in the two last named, and present in ascites, the wave being usually felt all over and at any part of the belly; and if firm pressure be made in either of the above conditions no tumour can be felt, and no more resistance at one part of the belly than another. A vaginal and rectal examination should not be omitted, and in either of the above cases no tumour will be felt. It is evident that this is not either of these conditions.

Now, what are the various tumours we have to choose between? Pregnancy, simple ovarian cyst, multilocular cyst, dermoid cyst, solid tumour of ovary, cyst of broad ligament, fibro-cystic tumour of uterus, fibrous tumour of uterus, extra-uterine gestation, hydro-nephrosis, malignant or other tumours of kidney, tumour of omentum, liver or spleen, pelvic abscess, hæmatocele, and, perhaps, I should add impaction of fæces in colon and distension of bladder. The exact diagnosis between some of these is sometimes a matter of great difficulty; but in this case we can easily exclude many of them, Distension of bladder: the position of dulness excludes this, and had it been necessary a catheter would have settled the question; and I would venture here to remind you that the symptom of incontinence does not necessarily imply a full or empty bladder, it may occur in either condition. In impaction of fæces you generally get a history of colicky pains, with scanty diarrhoea, or, perhaps, constipation, and a vaginal or rectal examination will remove any doubt. Hæmatocele: the size of tumour and length of time it has been present, and absence of menstrual irregularity. The size, too, will exclude abscess, as well as the absence of febrile symptoms. The history and position exclude enlargement of liver, and in splenic tumours you can generally detect the notch, and the tumour has grown from above; the history and position, too, enable one to exclude omental tumour. Malignant tumour of kidney may be excluded by the absence of hæmaturia and the normal condition of the urine. The hardness of the tumour, as well as the position of the area of dulness (in kidney tumours you find intestines pushed to the other side of the abdomen), exclude renal enlargements. Pregnancy and extra-uterine gestation are excluded by the regularity of the menses, the absence of mammary signs, the absence of foetal movements and heart sounds, and the history. Simple ovarian cyst and cyst of broad ligament are, again, excluded by the hardness

and absence of fluctuation; and that leaves us only multilocular or dermoid cyst, solid tumour of ovary, and fibrous and fibro-cystic tumour of uterus. The signs pointing to ovarian tumour are the impairment of the patient's general health, the rapid growth, the smooth surface and elastic feel, with fluctuation in parts, the inability to move the tumour with the uterus when the sound is introduced, and the possibility of raising the tumour out of the pelvis, and the regularity of the menses. Those pointing to uterine tumour: the age of the patient, the symmetrical enlargement, the lengthening of the uterine cavity, and the normal appearance of the umbilicus. I arrived at the conclusion that the case was one of multilocular cyst with a very short pedicle.

As regards the operation, it is one that I think may be fairly said to be yet in its infancy. Ovariectomy was, not many years ago, in the same position, though now it is one of the triumphs of surgery, and a surgeon undertakes such an operation as readily as, say, an amputation of a limb; but till within the last few years there have been very few amputations of the uterus by abdominal section for simple fibroid tumours, and I find a case recorded in an American journal for 1855, where the operator goes into the question whether having opened the abdomen and found a uterine instead of an ovarian tumour, he should proceed to remove it or close up the wound without doing so. In the case there recorded the operation was performed with fatal result, but not directly due to the operation, and previous to that it had only been performed five or six times. During the next ten years it was performed about twenty times, and as recently as in the year 1866 I think but few surgeons would have knowingly attempted the operation, and many eminent authorities would then, if on an exploratory incision a solid uterine tumour were found, have closed the wound without removal. It is now a recognised operation, and directions for its performance are given in the text-books; the results are such as to warrant perseverance in improving it, and to make it a surgeon's duty to recommend it, not only as a last resource to save life, but to relieve a patient from suffering. As to the method of performing it, the first steps are the same as for ovariectomy, the abdomen being laid open in the middle line, the tumour exposed and adhesions, if any are present, separated, and bleeding stopped; but when we come to deal with the pedicle it is not quite as simple a proceeding. In cases of ovariectomy, I think, most operators agree the best method to adopt is to tie the pedicle—stout silk is the ligature mostly preferred,—cut the ends short, and having removed the tumour, let the pedicle drop back into the abdomen. This does not, as might be supposed, act as a foreign

body in the peritoneal cavity, and set up peritonitis, but appears eventually to atrophy and disappear. To treat the stump of a uterus in this manner do not seem so desirable. The thick more or less elastic substance of which it is composed would be exceedingly likely to shrink in the course of a few hours; this would loosen the ligatures and give rise to internal hemorrhage, which would not unlikely be fatal, or at the best would necessitate reopening of the abdomen. In all these cases I should prefer to use the clamp, and fix the stump as I did here above the pubes. There are certain objections to the clamp, particularly the amount of traction there might be in the neighbouring parts, especially the bladder, but on the whole, it seems, safer, and you can generally leave enough of the neck of the uterus to prevent undue traction. The uterus may either be removed with the knife or *écraseur*, but when you have the clamp on and have at hand the means of arresting bleeding, should there be any, the *écraseur* seems unnecessarily to delay the operation and to bruise the parts; though should the tumour be too large to draw out at once from the abdomen, it may with advantage be reduced in size by the *écraseur*. In all cases, unless menstruation has quite ceased, both ovaries should be removed, and this may be done by tying their pedicles, cutting them off, and letting the ends drop into the abdomen as in ovariectomy.

As to the secondary hemorrhage I never heard of a case like this one. There are cases recorded where the patients have died from hemorrhage at or immediately after the operation; also where the ligature has loosened and there has been bleeding from the pedicle several hours or days after; but here the bleeding was from the divided vessels in the abdominal wall five days after the operation. It was, in fact, ordinary secondary hemorrhage external to the peritoneal cavity, such as you are always liable to after division of an artery. In clearing away the clots, however, one almost of necessity reopened the peritoneal cavity, there not having elapsed sufficient time for the wound to have firmly united, and even if I had not opened it accidentally I should have been inclined to look into the pelvis again fearing some hemorrhage might have taken place from the pedicles of the ovaries; but it was evident that the blood in the pelvis had merely trickled down, and therefore after again carefully sponging the peritoneal cavity I closed the wound. The case adds another to the successful cases of hysterectomy, and shows that under proper precautions the peritoneal cavity may be safely manipulated. The use of carbolic spray is not a *sine quâ non*; on each occasion of opening the cavity it broke down; but antiseptics were freely used all through the operation; the instruments and hands of the operators were

carbolised; great care was taken to thoroughly cleanse the peritoneal cavity; and the patient had been, so to speak, prepared for the operation by improving the general health and seeing that the functions of the body were properly performed. It teaches me specially the care one should take in making a diagnosis; and further, that in all operations of the kind one should be prepared for every emergency; for I must confess that I did not commence the operation prepared to excise the uterus; also the care one should take in arresting hemorrhage in the abdominal wall. I have some doubt whether I thoroughly twisted the vessels after removing the torsi-pressure forceps with which the hemorrhage was temporarily stopped; and again, I do not know whether the secondary hemorrhage was not due to the stitches having been removed too soon. Certainly, at the time I thought I had left them in long enough, and that they had done their work, and fearing their presence might have set up irritation; but I was guided too much by what I had seen in one or two cases of harelip, where I had, as I thought, bad results from leaving in the pins too long. In these cases it seems one had better be a day late than a day early in removing the stitches. Lastly, I may say that I saw L. D—— about the middle of June, and she was perfectly well and strong, had gained flesh, and was able to move about with ease.—*Lancet*, July 15, 1882, p. 45.

81.—ON THE DIAGNOSIS AND TREATMENT OF CHRONIC INFLAMMATION OF THE OVARY.

By LAWSON TAIT, Esq., F.R.C.S., Surgeon to the Birmingham Hospital for Women.

Now, when the removal of an ovarian tumour is fatal only when the patient has been tapped, or the operation injudiciously delayed, we are justified in performing abdominal section, not merely for the saving of life, but for the relief of suffering.

This new practice has had many good results, not the least of which is, that it is shedding a whole flood of light on the pathology of pelvic disease, and is even helping us to understand the physiology of the female sexual organs. Thus my own practice, the details of which will shortly appear in a special work, has convinced me that the usually accepted doctrine of the coincidence of ovulation and menstruation is wholly erroneous. The ovaries have nothing to do with menstruation; and though I give the opinion with a qualification which may be made necessary by further experience, so far the evidence before me is convincing that the phenomena of menstruation depend upon the Fallopian tubes and not upon the ovaries. Finally, and of most importance for my present pur-

pose, we are for the first time becoming cognisant of the real conditions involved in the disease recognised as chronic inflammation of the ovaries. For such a purpose as this, an abdominal section has been well said to be of as much value as a post-mortem examination; I would say it is more valuable, for we have the recent and exact clinical record side by side with the morbid appearances.

We all know that, in its healthy state, the ovary is just like the kidney—it is an organ of the existence of which the owner is profoundly ignorant. Unless it become diseased, it gives no sensations which indicate its existence. But, when diseased, no organ of the body gives such discomfort; and its diseases are often fatal, this result being by no means confined to cystoma.

Acute inflammation of the ovaries is often fatal; and, when not fatal, it generally leads to a state which makes lifelong misery. Though I have seen cases in which no history of an acute stage could be obtained, yet, like the same disease in other organs, chronic inflammation of the ovaries generally begins in the acute form.

The origin of the acute disease is various. It may be in a simple chill, in a hæmatocele, in an attack of gonorrhœa, in some exanthematic fever, or in miscarriage or childbed. The last two sources are by far the most common, and they present two specific varieties of the disease—interstitial oöphoritis and peri-oöphoritis.

Many of the cases of acute oöphoritis undoubtedly recover, and leave no mischief behind; but, in others, the permanent mischief gives rise to suffering which to men is fortunately inappreciable. Most patients will fix a date, from which they will say they have never known what it is to be well. A woman who has had acute exanthematic oöphoritis, with permanent mischief, will say that, since she had the small-pox, scarlet fever, or acute rheumatism, she has never had her periods as she used to have them. For a time, they were more profuse than before; then they became scanty and painful, the pain increasing as time went on, lasting a week, or even two or three weeks, in every month, rendering her utterly miserable, and being relieved by nothing but narcotics. We examine the pelvis, and find, perhaps, nothing at all. We give her iron and tonics, and all sorts of drugs, and she is no better. She goes to one specialist, and he divides her cervix or amputates it, without relief; to another, who puts in a galvanic stem; to another, who applies some useless pessary; and so on, all in vain. If she marry, she does not become pregnant. If she be in the better ranks of life, rest and luxury, with constant change of scene, make her life endurable; but, if she be the wife of an artisan, her lot is one long unhappiness till the

climacteric period is passed; and, during that period of trial, many of these women become drunkards.

Cases of chronic disease arising from acute peri-*oöphoritis* give usually more specific indications, at least to one accustomed to pelvic examinations. Suppose that it has arisen in some attack during the puerperal month, the patient will say that she was ill with "inflammation of the bowels," and was a long time in getting about; that she has never been pregnant since, and is hardly ever free from pain. The majority of these cases occur in primiparous women; and therefore the first feature in the case to be noticed is often that the patient has had one child soon after marriage, and has never again become pregnant. If the patient be living a married life and bearing children, that alone is proof that she is not the victim of this disease, for it uniformly unsexes the sufferer as far as maternity is concerned. It also unsexes its victims for marital life in all severe cases, for they cannot endure it; and in the milder cases they cannot get well, as long as they have to submit to it.

As far as general symptoms are concerned, they are rarely free from pain; and this is generally intensified during the menstrual week, for the reason that the tubes are always involved. In most of the cases, the tubes are chiefly at fault; for I often find the ovaries cystic or shrivelled, so as to be of little account in explaining the symptoms. There is always pain in the left side in the groin; for, if one ovary be affected, it is sure to be the left. In the exanthematic cases, we have to trust almost entirely to the story of the patient to subjective symptoms; and therefore, in this class of cases, mistakes will be made until we arrive at a more perfect method of diagnosis. In the second class of cases, however, the objective conditions are easily recognised by the practised finger. A fixed and tender mass, composed of the enlarged and probably adherent ovary, or of the occluded and distended tube, will be felt on one or both sides of the uterus through the vaginal *cul de-sac*; and the peculiar sickening pain felt by the patient when the mass is touched will afford conclusive proof as to its nature.

What is to be done to relieve such cases? The general principles of treatment are those applicable to all such conditions, in whatever part of the body they are met with. The first of all is rest; but, unfortunately, we cannot rest the ovaries or the Fallopian tubes. The former will go on trying to fulfil their function of ovulation; and every month, or oftener, the inflamed organs are temporarily congested by the occurrence of menstruation. Much may be done, however, by absolute rest in bed for the whole menstrual week, and absolute abstinence from intercourse. It is very rare, however, that we can persuade

patients to carry out this regimen long enough; and hospital patients will not attend to it at all—indeed, they cannot. Counterirritation by blisters or setons is also to be tried. The only drugs of the slightest use are bromide of potassium and ergot.

After a persistent trial of these without benefit, there remains for consideration the question of removal of the diseased organs—a proceeding which is based on the soundest and most completely accepted rules of surgery. Let us take a perfectly parallel case. From some injury or gonorrhœal infection, an eye becomes acutely inflamed, and the acute process is followed by intractable chronic inflammation of the structures of the globe—a matter of every-day occurrence. The ophthalmic surgeon removes the diseased organ, to save the patient's discomfort, perhaps the sight of the other eye, perhaps his life. He mutilates the patient most seriously in that part of the body where mutilation is most dreaded. He removes a diseased and useless structure. We remove inflamed and useless ovaries and tubes to relieve suffering, in some cases to save life; and we do not mutilate our patients half so seriously as is done in the removal of an eye. The removal of a diseased eye often fails to save the other, and is then an useless operation. Removal of a cancerous eyeball is always an useless operation, for the disease always returns.

Removal of the inflamed uterine appendages may yet turn out to be a failure for some cases; but it never can be so bad as the removal of an eyeball for cancer; and, in the hands of experienced operators, the operations have quite an equal risk. Besides this, the operation for the removal of the uterine appendages is as yet in its infancy; we have very much to learn about it; yet, in spite of this, in my hands, of thirty-five cases performed for chronic inflammation, there has only been one death, or a mortality of 2.85 per cent.—a mortality which, I have some reason to believe, is less than that of excision of the eyeball. This one death was due to causes entirely preventable, and ought not to have occurred. The operation is justified by its primary success; and my belief is that my mortality, as my experience grows, will not be more than 1 or 2 per cent.—*British Medical Journal*, July 29, 1882, p. 161.

82.—ON ERGOT, AND ITS ACTION ON THE UTERUS.

By JOHN DEWAR, Esq., L.R.C.P., Physician to the Hospital for Women and Children, Vincent Square, &c., London.

Certain preparations are inert, or nearly so, as the stale powder and the ordinary tincture. Heat is said to be destructive in preparing it, though old practitioners who have for a

lifetime been in the habit of making at the bedside "tea" from the powder or the "beans" will doubt this. Alcoholic extracts are less powerful than aqueous ones. But it is even now a disputed point among chemists and physiologists as to what its active principle is. Levi says it is due to phosphoric acid, Winckler to the trimethylamine it contains, and Dragen-dorff to sclerotic acid, and this seems the most likely. Most observers agree that ecbolin and ergotin are *not* active principles, and that these never bring about the specific action of the drug—the so-called *ergotin* in use not being ergotin, but a compound body. However, all this is of minor importance to the physician provided he obtains an active preparation. The liquid extract and the ammoniated tincture are the best, the latter especially, in obstetric practice. Ergotin is most convenient for subcutaneous injection.

I shall not discuss toxic effects, which are never produced by any dose ever given by the medical practitioner. But the physiological action of ergot is most important. All experimenters are agreed on certain things, *viz.*, that the arteries of the body are contracted by it, that blood-pressure is increased, that there is slowing of the heart's beat and pulse, and, if the remedy be pushed, that the pupils become dilated, that there is coldness of the surface and anæsthesia. Nearly all physiologists agree thus far. But how does ergot bring about the contraction of the arteries? are veins as well as arteries equally affected? and does it act on nerve centres, or the peripheral ends?

All physiologists agree that ergot increases the inhibitory action of the sympathetic (nerves of Remak), and thus causes the arteries to contract. If the sympathetic fibres are paralysed or cut through the arteries dilate, if they are stimulated they contract, therefore ergot stimulates the sympathetic. But Brown-Séquard, Holmes, and Wernich, tell us that ergot acts when the sympathetic is cut. That being so, ergot must act in one of two ways; either through the sensori-motor nerves, or by stimulating the cut or peripheral ends of the sympathetic in the same way that galvanism does.

Let us call to mind the composition of that (to use the language of Charcot) "physiologically complex totality called a nerve." Every sympathetic ganglion has three sets of fibres; a motor, a sensory, and sympathetic proper (grey fibres of Remak), and the action of these are antagonistic. Thus secretion in a gland is *arrested* when the motor fibres are cut, *increased* when the fibres of Remak are cut, also increased if the sensory fibres of the vaso-motor are *irritated* or excited. Let us suppose then that ergot is given where the fibres of Remak have been cut, in order to get *diminished* secretion (and

that implies diminished supply of blood) a *paralysing* effect must be produced on both the motor and sensory fibres. This I believe actually takes place, judging from a therapeutical fact I shall presently mention, as well as from the anæsthesia and coldness of surface found in cases of poisoning by ergot. Nicotine, who has experimented with sclerotic acid, says the peripheral ends of the sensory nerves are paralysed. Köhler confirms this view. That the nerve centres themselves are affected there is no proof, nor is that required to explain the actions of ergot. That some dulling of a nerve centre should take place from the anæmia produced by the contractions of the vessels is likely enough, but beyond this there is no satisfactory experimental evidence of ergot affecting the nerve centres.

How does ergot act on the uterus? The usual theory is that it *irritates*, or that it causes *anæmia* of the motor centre of the uterus, wherever that may be, and so causes muscular contractions. But all the evidence—experimental and therapeutical—goes to prove that ergot has rather a *sedative* than an irritative effect. Kussmaul records a fact which better explains its action. He says that “spasm of arteries causes clonic contractions of muscles.” We know that from its inhibitory action on the sympathetic ergot contracts the arteries, and thus is explained the clonic or intermittent contractions on the parturient uterus. There is also evidence that ergot acts on all involuntary muscles, on the heart, on the muscular fibres of the bowels increasing peristalsis, &c.; and in toxic doses general convulsions are produced. This action on muscle is most probably through the nervous system, and not from any special action on muscles themselves.

On the parturient uterus every one has tried the effects of ergot, yet obstetricians are frequently disappointed in its action, so much so that many say it is useless; and I suppose every one has felt it to be provokingly uncertain, even in a most suitable case—a well-advanced labour free from mechanical obstruction, a dilated or dilatable os, and a multipara. In vain are large and oft-repeated doses given, the sluggish uterus will not act. Whether it be the only one or not, I know one cause to be due to the drug being inert. After a pretty extensive trial of powder, tea, tincture and liquid extract, I have found the best results from the *Liquor secale ammoniata*, when well prepared. Let one typical case suffice: Mrs. M.—in labour with her seventh child; usually *very* quick. Visited patient at 8 o'clock in the morning. She had been in labour all night, during which time the membranes ruptured. Pains very feeble; os dilatable and as large as the mouth of a teacup. Went home, returned about twelve and found her much in the

same condition. I then gave liq. sec. ammon. (Ferris) 3 i.; in thirty-five minutes sharp pains came on, and in other fifteen minutes the child was born. Placenta came away easily. In this case the labour had lasted eighteen hours. In cases where I have given 3 iss. of the secale for a dose violent uterine contractions have taken place, expelling the child and retaining the placenta for some time by hour-glass contractions. This retention of the placenta I have frequently found after giving large doses, but not with drachm or half-drachm doses.—*Practitioner*, May 1882, p. 356.

83.—HYSTERICAL SPINE—CASES AND TREATMENT.

By OSMOND VINCENT, Esq., F.R.C.S.Ed., late Surgeon to the National Hospital for the Deformed.

The subject of hysteria is a very ample one, and I shall not attempt to touch upon the general pathology, and the different phenomena of this most curious disease, but shall content myself with describing the symptoms and treatment of the particular form of hysteria known as hysterical spine.

The first symptom and the usual reason for the first visit of the patient is *pain*. "I have such awful pains in my back." Now in slight, and even in severe, cases of lateral curvature, which particular deformity the hysterical spine most nearly simulates, there is seldom any pain, and when we come to investigate this pain we soon discover its nature.

We are all aware that, when any of the tissues of the body are the seat of acute or chronic inflammation, the pain which results is augmented by pressure; but the pain we are considering, and which is alleged by the patient to be "all down the spine," is not increased by pressure. For instance, if the patient is placed face downwards on a firm mattress or couch, the whole weight of the surgeon's body transmitted to the spine by means of the open hand will give no pain; but, on the contrary, if the finger be drawn lightly over the spinous processes, from the cervical portion down to the sacrum we shall have a scream or sob, together with considerable cringing or flinching. So the apparent suffering of the patient bears no proper proportion to the pressure exercised.

Another test producing a very characteristic symptom of these cases is to tap gently the spinous processes as the patient stands erect before you. The same flinching will be observed, and by these means one is often enabled to more or less localise the pain. The seat of this will generally be found in the lumbar region, especially if we can trace any uterine irregularity arising from any cause whatever. The second symptom is deformity. This may exist in various degrees, from being

hardly noticeable to an extent simulating the worst form of lateral curvature; but, unlike that far more serious disease, the hysterical deformity can in a minute be reduced, although, when the pressure or manipulation necessary for this is removed the deformity returns; yet for the moment it has vanished, and we have satisfied ourselves that there is no structural change.

These two symptoms will generally be found sufficient to determine the nature of the case, especially if our diagnosis be assisted by the existence of any of those morbid conditions of the emotional centres so well known and recognised in the phenomena of hysteria.

The prognosis of hysterical spine is generally favourable, especially in the younger cases. I have never seen a case under thirty that has not completely recovered, and I am of opinion that such of the older cases which do not get well, are due to climacteric disease, and are better dealt with by the obstetrician than by the surgeon.

In the treatment of these cases, if there is anything like severe apparent deformity, nothing short of an instrument will do; but this should be of the lightest and simplest kind, for we do not want to exercise any force to overcome adverse muscular or fibrous contraction, but simply to support the spinal column, and supply the place, *pro tem.* of those muscles, which have, as it were, "struck work," and remind them of their use and duty.

Our next valuable agent to the support, and in slight cases to be used without it, is cold water. There is generally an innate dislike in hysterical patients to this most valuable remedial power, but of all treatment this is the most reliable, acting, as it does both on the superficial nerves, and also on the whole system, by means of shock. The best way of applying the cold water is, if possible, by the douche, with as much force as the patient can bear; but if this is not available—and in very few private houses can it be efficiently carried out—then a large sponge-and-hip or sponge bath are all that is needful, the sponge being filled with cold water, and held at the nape of the patient's neck, and slowly, *very* slowly squeezed, the water thereby being allowed to *trickle* down the spine.

This, followed by a sharp friction of a glove of some soft texture at first (as hysterical patients cannot bear the coarser forms, such as horsehair, or Cash's towels, for the first few weeks) tends very greatly to help the cure. This douching should be morning and night, care being taken that a good reaction sets in after each application. Two or three hours' rest should follow on the rubbing. (This resting should be on a hard mattress, and without the support, if one be worn.) Then five minutes trapeze-work, the trapeze being just high

enough for the patient to swing clear of the ground. After this more repose, and afterwards a good walk of a mile or two out and home (according to the strength of the patient), without loitering or looking into shop windows. This *régime*, if regularly carried out, will be found all that is necessary in the way of external remedies.

As regards internal remedies, they are not of much use, except as influencing the mental state of the patient; but as a rule, the more disagreeable and nastier the mixture is the better, as it is a sort of inducement to the patient to exert herself in order to get better, in order to be able to leave off the obnoxious medicines. I usually give a mixture of strychnine, valerian and sulphate of magnesia, and find that is about as nasty as it is possible to get.

Above all, good moral influence is the thing for these cases. Never, for your own credit's sake, treat a case at her own home, where there is at least one sympathising relative, who, by his or her weak and injudicious pity and interference, defeats your best attempts at cure. Get the patient away from all friends, and place her with some gentle but firm woman who will carry out your orders with a conscientious, but kind, strictness, and who, while paying little heed to the hysterical cry, will at once relax any of the treatment that may, in the individual case, seem too severe.

By these simple means, if properly carried out, you will, in a few months, or even weeks, return to her delighted friends, cured, the case that has probably come to you as one of severe spinal disease with structural change, and surrounded by alarming complications.

Case 1.—H. A., 24, a well-developed, florid-complexioned girl, presented herself at the hospital complaining of pain in the back. In May last year she had been told she had spinal disease, so sought advice. The examination revealed great tenderness on percussion over the whole length of the spinal column, and a great amount of hyperæsthesia; she was unable to keep the spine straight by the exercise of her will for more than a few seconds, but swayed from side to side, and then dropped into a chair, if handy, but if not, on to the floor. The uterine functions were all wrong, dysmenorrhœa having existed for two years, and I learned that she was sometimes fifteen hours a day on her feet, in the vitiated atmosphere of a draper's shop. There was also marked globero-hystericus. The case was not severe enough to need a support, so she was treated by the trapeze and cold douche, and all but complete recumbency, with a mixture of Epsom salts and tinct. ferri perchlor. After two months she could stand firm and erect for any length of time, and bear any amount of rubbing and tapping. She

continued the cold bath every morning and obtained a situation of less severity, and up to the present time has been quite free from her hysterical spine.

Case 2.—A. D., 30, a widow of six months, had been nursing her husband through a long illness, and was very much broken down; sallow complexion, dark rim round her eyes, perfectly unable to sit up owing to the “giving-way” in her back. When supported by the hands placed in the axillæ the spine could be brought perfectly straight, but relapsed into a state of “limpness” on the support being removed. The pain was intense on slight pressure, and the cry produced most characteristic. The support was worn for three weeks before she could attempt the trapeze, but at the end of a month she could swing for three or four minutes and *almost* enjoy it. The great difficulty in this case was the cold water, the shrieks and howls that it occasioned rendering it necessary to leave it off, and it occurred to me that a Chapman’s spinal ice-bag might do as well if applied for one or two minutes daily. This I found perfectly successful, and after about ten days she was able to bear not only the cold sponge, but the friction afterwards. She had the strychnine and valerian mixture, and although it was quite six months treatment in all, she perfectly recovered.

Case 3.—H. S., 21, medium height, good development, and apparently good constitution, up to 18 never had bad health. Fell from third storey at that age, and, according to her own description, fractured her skull, and was insensible for fifteen days. Ten days after recovering consciousness she lost the sense of smell entirely. This continued for four months, when violent pain in the back began, the sense of smell being regained. This pain has existed until the present time, the lightest touch anywhere in the region of the spine produced a spasm almost tetanic. She could not raise herself from the couch on which she was lying, nor could she keep herself erect. After determining it was a case of hysterical spine, I, with some difficulty, got her to submit to the cold douche, she bravely persevered, and after a month she could sit up, and we soon began the trapeze, and finally some walking exercise, and four months after the first cold bath she was quite well, and has remained so for more than nine months. I should remark in this case the catamenia, which had ceased directly after her accident, recommenced—scanty at first, but soon becoming normal—directly after the douching had been begun.

I have had several other cases of more or less interest and severity, and I trust I have been able to demonstrate that there is not only such a condition to be diagnosed, but also a good prognosis, and a fairly easy remedy, for hysterical spine.—*Medical Press and Circular*, October 4, 1882, p. 275.

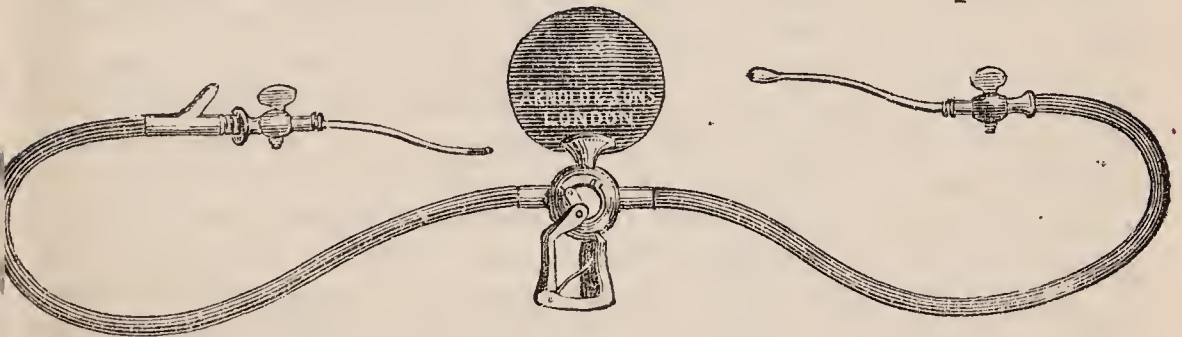
84.—ON TRANSFUSION—A NEW APPARATUS.

By J. F. LE PAGE, L.R.C.P.E., Durham.

Convinced that in the conservative practice of the future transfusion will hold a place of no little importance, and will be more and more extensively resorted to, and seeing that the means at present at our disposal for the performance of the operation are not altogether satisfactory, I have devised an apparatus in which there is an endeavour to combine absolute safety with great facility in use.

Of the transfusors which have been at our service that of Dr. Aveling is, perhaps, all things considered, the most serviceable; but it has the disadvantage of requiring very complex manipulation. To put it concisely, each of them requires in its use for the surgeon to be aided by skilled assistance, whilst at the same time there is no safeguard against the injection of a minute quantity of air, however careful and adept the operator may be; an accident which, in all probability, would prove fatal to the patient.

The accompanying illustration shows how these disadvantages are overcome. One hand alone is needed to operate the



transfusor, and the other hand is at liberty to attend to the efferent tube; whilst the attention of the surgeon may be divided between the recipient and the donor of the blood. If any portion of air should at first remain adherent, and, of course, unseen, on the inner surfaces of the tubes, and, during the passage of the blood, be carried along with the stream, their course is with certainty arrested by the glass air receiver, into which they must rise. As to the *modus operandi*: The case contains the apparatus, knife, forceps, and a small bottle, which latter is intended to hold a compound powder composed, say, as follows: Carbonate of soda, ten grains; phosphate of soda, two grains; chloride of sodium, thirty grains. One-fourth of the powder should be dissolved in about two ounces and a half of water at a temperature of 100° F. A few drops of alcohol may be added, and the vessel containing the solution placed in another vessel partly filled with water at a temperature somewhat higher. Then, having attached the

receiving and delivering tubes, the two extremities of the instrument must be placed in the inner vessel with the air chamber downwards. Now press the lever, press the elastic ball, release the lever, release the elastic ball, and, after repeating that process once or twice, turn both taps. It is now ready for use. Raise the patient's arm to the horizontal position, so as to facilitate the transmission of the blood to the heart, and, having inserted both tubes, one into the supplying vein, and the other into the receiving vein—the right median basilic is, perhaps, the best—turn the taps, and, in the same order, press the lever, press the ball, release the lever, release the ball, and so on. Precisely one quarter of an ounce passes out each time. It is expedient, having commenced the transmission of blood, to complete the process without arrest, lest coagula should form. The apparatus is made by Messrs. Arnold and Sons, and their name is quite sufficient guarantee for excellence of workmanship. I must, however, say that my thanks are due to them for so faithfully, so well, and with such precision and care elaborating from my drawings an instrument of some elegance.

A word as to the cases in which transfusion is indicated. My special intention is that of supplying the obstetrician with a safe and facile means of transfusing blood after post-partum hemorrhage, where the diastaltic system is practically dead, and the heart is dynamically incapable of action in consequence of the absence of fluid to act upon. But transfusion is indicated in many other cases than that of uterine hemorrhage leading to this condition. For instance, when, after excessive hemorrhage, the vital fluid is not reproduced, and the nutritive process is so impaired that the persistent anæmia would be the forerunner of phthisis or other grave disease did we not supply red corpuscles to carry oxygen with which to re-establish those functions which are essential factors in the formation of hæmoglobin. And it is certainly indicated in some cases of hemorrhage from the bursting of an aneurism, or where a main artery has been divided. With its aid life may at least be prolonged, where the stomach and rectum refuse to retain nutriment in the exhaustion from marasmic disease. It may also be resorted to in the asphyxia of new-born infants, the injection being made through the umbilical vein, having previously allowed a little blood to escape from the umbilical artery. For this purpose a small quantity of blood taken from the placenta and defibrinated will answer very well. In chronic as well as in acute anæmia we may transfuse, for where the whole blood is altered by toxic or pathological causes it is manifestly advantageous to improve its quality by the admixture of healthy blood. It may also appear indicated after hemorrhages from

the stomach and intestines, hæmoptysis, and some surgical operations. I would go so far as to suggest, on physiological grounds, its occasional indication in hemorrhagic fever. In the young who are robust, absorption and nutrition will soon replace the normal quantity of fluid, although for a time it will be inferior in quality to that which was lost, containing less than the due proportion of oxygen carriers, the red corpuscles. In those previously suffering from anæmia, and in the aged whose blood is very slowly reproduced, it appears to me that the operation may, with very great promise, be repeated even more than once, at intervals of a few days. In cases of poisoning, when the nature of the poison is unknown, or when an antidote would not be effective, or in pyohæmia, might not occasionally a life be saved by alternate depletions and injections of pure blood? In epilepsy it has been used with marked success. And, as in puerperal eclampsia we may presume an excess of carbonic acid and a deficiency of oxygen, may we not here also find it of no little service? I should remark that Dr. Schäfer has most conclusively shown that the action on the blood-corpuscles of beef peptones, milk, and some other fluids, when used in lieu of blood, is most injurious.

It has been urged in disparagement of the operation that during transfusion very painful symptoms are experienced, followed, after its performance, by alarming prostration and hemorrhagic fever. This we may admit to be, in some cases, substantially correct. But what is the cause of all this, but that the vital powers are so stimulated to reassert themselves that the heart and arteries, certainly with intermissions, are making very violent efforts to drive along the small quantity of blood which the system contains? The inference is clear that this most valuable operation has not been so frequently performed as it should have been, and that many invaluable lives have been lost which might have been saved by the immediate restoration of the failing powers of the heart and nervous system which it most strikingly effects.—*Lancet*, Nov. 11, 1882, p. 803.

ADDENDA.

85.—SOME FURTHER REMARKS ON ANÆSTHETICS, AND THEIR ADMINISTRATION.

By S. OSBORN, Esq., F.R.C.S., Chloroformist to St. Thomas's Hospital, London.

[Mr. Osborn makes the following additions and alterations to his previous Annotations on Anæsthetics, published in the Reports of 1880 (see *Retrospect*, vol. 82, p. 314). The alterations are neither important nor numerous. The substance of what he then stated he still adheres to; but finding that his paper has been recommended as a practical guide to house-surgeons, he wishes to make a few additional remarks, due in some measure to suggestions made by friends, and in part to further experience.]

When ether is to be given by Clover's portable regulating inhaler, two ounces of ether—this amount being equal to the contents of the small tin porringer placed in each box—will be found sufficient to commence with. For if the patient struggle, a larger amount will overflow and allow of the liquid ether to escape into the inhaling tube. After the lapse of ten to fifteen minutes the amount may be replenished by another half porringer full, and later on, if the operation be a long one, by another half porringer; but four ounces will generally be found sufficient for the longest operation. Ether of $\cdot 720$ sp. gr. is better than $\cdot 735$ as it combines better with chloroform and has less tendency to produce hyperæmia of the bronchial passages. Four parts of ether to one of chloroform is a very useful combination for eye or rectal operations, which require more profound anæsthesia. An improvised inhaler may be well contrived out of an inverted soda-water glass, in the bottom of which is placed a sponge covered by a napkin; the latter, coming over the rim of the glass, is folded backwards on the outside.

Clover's gas and ether inhaler (Mayer and Meltzer) has become now the favourite apparatus for the administration of anæsthetics in several of the London hospitals. Its mechanism being so constructed that it lies in the power of the administrator to give first nitrous-oxide gas alone, then a combination of gas and ether, and finally ether alone.

The advantage of quieting a patient preparatory to the giving

of ether, by the administration of a few inspirations of nitrous-oxide gas is so very slight, that the usefulness of this inhaler is seriously counter-balanced by the increased cost of the instrument and its greater cumbersomeness, compared with Clover's portable regulating inhaler. Another advantage stated in its favour is that no ether is wasted, it being unnecessary to empty the cylinder after each operation, but only to close the stop-cock. But comparing the small amount of ether now required by either of Clover's inhalers in comparison to the large amount *wasted* by the use of other apparatus, this need hardly be mentioned, and taking into consideration the cost of nitrous-oxide gas, the expense of the administration far exceeds the saving in ether. Another point in favour of the portable inhaler is the larger graduated scale for the regulation of the volume of ether to be administered.

An objection I have heard raised against Clover's apparatus is, that there is necessarily a certain amount of carbonic acid poisoning. Such is undoubtedly the case, but the success of his inhalers is quite sufficient to override this objection.

Ethidene dichloride I have no experience of. The variability of its composition is the great objection to its use, and it is on this account that I prefer to use ether.

Protoxide of nitrogen, or nitrous oxide, or laughing gas (Messrs. G. Barth and Co.), is used principally for dental operations, where the extraction of teeth and such operations of short duration can be performed within a few minutes, for a prolonged use of this anæsthetic is dangerous, and therefore not applicable to any operation of magnitude, or rather of long duration, the two being almost identical.

Nitrous-oxide gas is given by Clover's combined inhaler, which I previously spoke of when describing the inhalation of ether. One minute is about the time occupied in producing insensibility with nitrous-oxide gas, or after three stertorous inspirations have taken place the patient will be found in a condition fit for operation.

Nitrous-oxide gas produces great congestion of the vessels of the face and head generally, shown by the lividity of the countenance, and also occasionally causes bleeding from the nose or even hæmoptysis. Therefore, in a case of severe disease of the arterial system, such being operated upon for ligature of a vessel for the cure of aneurism, I should not administer gas prior to the giving of ether.

In some patients where anæsthetics have been taken badly on a former occasion, small doses of ether and chloroform taken internally have been recommended with a view of getting the constitution accustomed to these drugs.

When giving anæsthetics, the head of the patient should be kept on a level with the body or on a gradually inclined plane, not doubled forwards by too great a number of pillows under the head, for by so doing curves are made in the windpipe, but let the exit from the lungs to the mouth be in one straight line.

To know when the patient is sufficiently under the influence of any anæsthetic for the operation to commence, the conjunctival surface should be touched with the tip of the finger, and if no reflex action takes place, shown by the contraction of the orbicularis palpebrarum muscle, a sufficient degree of insensibility has been produced. The corneal surface of conjunctiva is more sensitive than that covering the sclerotic; therefore, if the latter shows insensibility when touched the anæsthesia will be found sufficient for ordinary purposes; insensibility of the former being, of course, required for operations upon the eye itself. It must be borne in mind, however, that the conjunctival surface repeatedly touched by the finger eventually loses its sensibility. This fact must be borne in mind by the chloroformist, and first one eye and then the other be touched, or a false impression that the patient is thoroughly anæsthetised may be conveyed. Paralysis affecting one side of the body may also occasion loss of sensibility of one conjunctival surface.

Dilatation of the pupils is a sign of the anæsthetic having been pushed to a sufficient extent, and the inhaler should be immediately removed from the face.

Flaccidity of the limbs is no sign of cutaneous insensibility.

How long does it take to get a patient under the influence of an anæsthetic?

Nitrous-oxide gas will produce insensibility in one minute, but the effect being so transitory it can only be given for operations which can be completed in five minutes. Ether given by any open inhaler will not produce insensibility under eight or ten minutes; when given by Clover's portable inhaler, insensibility can be produced in from three to four minutes, and when preceded by a few inhalations of nitrous-oxide gas in from two to three minutes. But if nitrous oxide is not used, the space of time occupied in producing insensibility is the same in both of Clover's apparatus. The time occupied, however, and by any apparatus, is always shorter in the warm weather, and a longer time is required for persons of strong constitution or accustomed to much alcohol. The amount of the anæsthetic required varying in a corresponding degree to the vital capacity of the patient.

Chloroform, when used in children and old people, produces insensibility in about two minutes or rather less.

How long may a patient be kept continuously under the influence of an anæsthetic?

Nitrous-oxide gas, as was previously mentioned, can only be given for a space of one minute, therefore ether or chloroform is used when duration is of consequence, and of the two I undoubtedly give the preference to ether on account of its being a vascular stimulant. Two hours and fifteen minutes is the longest time that I have given ether continuously, but even then after discontinuing the application of the mouth-piece the patient was, of course, considerably longer in a state of unconsciousness, although not entirely insensible, as shown by touching the conjunctiva. In cases where anæsthesia is kept up for a long period, shock, partially due to the anæsthetic and partially due to the operation, is developed to a greater or less extent, shown by coldness of the surface of the body and extreme prostration. This is best combated by the application of a warm-water bottle to the cardiac region, and subsequently, when the operation is completed, by an egg-and-brandy enema.

Some peculiarities occasionally occur during the administration which are interesting and should be known to the administrator. The inhalation of ether frequently produces exanthematous patches on the face and upper parts of the body, and I have known a case to be removed from the operating table under the impression that the patient was suffering from one of the eruptive fevers and unfit for operation. The origin of this phenomenon is to be found in paralysis of the vasomotor nerves by the anæsthetic. I should mention also that if any skin eruption is present it is made by the same cause more prominent.

A false impression when feeling the pulse may be very easily conveyed, as in a case I remember where the patient, lying upon the arm, compressed the main artery and stopped the pulse greatly to the consternation of the anæsthetist. The case was one of removal of a tumour from the right scapula, the radial artery being abnormally situated and absent on the right side; the patient was suddenly brought over on to the left side for the convenience of the operator, and the left radial was stopped by compression from the weight of the body.

Elevation of the jaw, by pushing the angle of one or both sides forwards, acts upon the tongue and gives freer respiration. The converse also is easily seen, as I have frequently demonstrated to the students, that by pushing the lower jaw backwards, the breathing can be immediately impeded or altogether arrested. As it is difficult to raise the jaw, both hands being occupied, one holding the pulse and the other the inhaler, I have

devised an underchin support which I call jaw compasses, being of that configuration, for the purpose of going behind the angles of the jaw and drawing them forwards and upwards. The administration by this procedure being considerably assisted. A circular india-rubber band, similar to that used for keeping letters together, passed over the nose-piece of the inhaler and under the symphysis of the chin, will also answer the same purpose.

The administration of anæsthetics for cases to be operated upon for the cure of cleft palate are always troublesome, and it is usually found that chloroform for these cases is best. Ether causes not only an increased secretion of saliva, but also increased vascularity, and the mouth being wide open, patients return to consciousness sooner than when chloroform is given. Another difficulty in these cases is the insertion of the mouth-gag, the breathing on its insertion becomes immediately impeded by the tongue being thrown backward at the same time as the lower jaw is depressed. A good mouth-gag is much wanted, its requirements being to keep the mouth open, to draw the tongue forwards, and to push the lower jaw forwards. The one that most fully meets these requirements is described in the London Medical Record (April 15th, 1881).

The use of chloroform is necessary for all operations upon the interior of the mouth (removal of tongue, &c.), for the same reasons as mentioned when speaking of cleft palate. When the mouth has to be kept open for some time, I frequently use Clover's chloroform bellows manufactured by Messrs. Coxeter and Son, whereby a mixture of chloroform and air is blown down the back of the throat.

The question whether anæsthetics should be given at all in eye operations is a debatable one, the vomiting from chloroform and the vascular turgescence from ether being the objections to their use. I consider that anæsthetics are always necessary for ophthalmic operations upon children, but never for adults, except in cases of enucleation and for operations upon the eyelids.

Chloroformists should not administer anæsthetics for too long a time at one sitting, for the administrator after giving anæsthetics for two or three hours consecutively, becomes somewhat anæsthetised himself and lacks that amount of vigilance which he had at the commencement, and ought to have throughout the whole of the administration. This is more especially the case when open inhalers are used. There is in addition great mental strain to the administrator from the anxiety and constant watchfulness entailed.

The element of danger is more often present in rectal operations. Why I cannot say; but undoubtedly I have had, and others also, more anxiety over the administration of anæsthetics in these cases. Whether it arises from the fact that *all bloodless operations are dangerous in plethoric individuals*, or whether diseases of the bowel are unusually depressing, and that the highly sensitiveness of the rectum requires a greater degree of anæsthesia, I am not in a position to say, but the fact remains the same.

In cases of stoppage of the heart's action, in addition to percussion of the heart with the wetted end of a towel, artificial respiration must be immediately commenced, because the stoppage of both factors would make up the whole fatality. Inversion of the body should be always tried if stoppage of the heart's action occur. The head being lowered and the legs elevated the blood is sent to the upper part of the body; a similar effect is produced but less quickly by the application of bandages up the legs. The latter may be adopted with great advantage in operation about to be performed upon anæmic patients. Inversion of the body should be maintained until the heart's action is resumed, for success has been found to follow this procedure.

The post-mortem appearances of fatal cases show that hepatisation of the lungs with adhesions to the pleural surface, or a fatty heart, or one having adhesions to the pericardium, are more especially antagonistic to successful anæsthesia.—*St. Thomas's Hospital Reports*, vol. xi., 1882, p. 23.

86.—POISONOUS EFFECTS PRODUCED BY THE TOPICAL USE OF IODOFORM.

By HENRY E. CLARK, Esq., M.R.C.S., Surgeon to the Glasgow Royal Infirmary.

Iodoform has, during the last few years, been very extensively employed as a local application to soft chancres, sluggish ulcers, strumous joints, and burns, but until quite recently the surgeons so using it have had no suspicion that it might give rise to serious constitutional disturbance, and that in some cases even a fatal issue might ensue where its external application was long continued, or where the surface to which it was applied was capable of rapid absorption. It is, therefore, desirable that all cases in which poisonous effects are observed should be carefully recorded, in order that we may ascertain the conditions under which such effects arise, and may be able to identify the symptoms at the very earliest possible period, so as to stop the treatment and thus avert the danger. To this end I desire to place on record the details of the following case, which has recently occurred in my wards.

G. Y., a boy, aged 14, was admitted into Ward 16, on 13th April, 1882, suffering from a sinus of the left groin, the result of a chronic abscess in front of the hip joint. The sinus extended to the inner side of the femur, and a probe introduced into it passed to the back of the lesser trochanter. On admission he was put under chloroform, the sinus was freely opened up, and was injected with 1-40 solution of carbolic acid, and pressure applied. As little progress was made, the treatment was changed during my absence from duty—the sinus being washed out with an ethereal solution of iodoform, and bougies containing iodoform and eucalyptol ordered to be introduced, one each alternate day; these, I understand, contained about 5 grs. of iodoform each. A few days after my return, my attention was called to the boy, as he was suffering from great depression, was nauseated, and vomited everything introduced into the stomach. The vomited matters were viscid in consistence and greenish in colour. The pulse was very rapid and feeble, averaging 130 to 160 per minute, there was persistent frontal headache, and a dull mental state, which did not, however, prevent the patient answering questions rationally; there was no delirium. Dull pain in the epigastrium was complained of, and the patient was evidently losing flesh. The temperature showed a marked rise, but it was noted, from the beginning of the attack that the morning fall was greater than would be the case with any continued fever, or in other words, that the pyrexia was irregular. The following copy of the temperature card will show the marked variations which were observed:—

Date.	Morning.	Evening.	Date.	Morning.	Evening.
May 8th,	102·8°	May 15th,	99·2°	101·4°
9th,	100·8°	103·4°	16th,	99·4°	102·6°
10th,	100°	101°	17th,	98·4°	100·2°
11th,	100·2°	103·8°		102·4° at 10 p.m.	
12th,	99·4°	102°	18th,	100·6°	99·2°
13th,	98·6°	100°	19th,	98·6°	99·8°
14th,	99°	103°			

After this date the temperature was normal, excepting on the evenings of the 22nd (100·2°), the 25th (101°), and the 31st (100°). The existence of abdominal pain at the outset of the attack led to the suspicion of enteric fever, but the pain was confined to the epigastrium, and there was no diarrhoea. The vomiting was too persistent, and the pyrexia too irregular for this suspicion to be long maintained.

At the time when we first suspected the iodoform to be the cause of the attack (namely on 9th May) nine bougies had been used; but although these were at once stopped and the sinus washed out with a weak solution of carbolic acid, the

symptoms did not abate. This is quite accounted for by the depth of the cavity, and the fact that it had no outlet posteriorly, so that iodoform was stored up in it, and was washed out only very imperfectly. In about three weeks from the commencement of the attack the temperature returned to the normal level, the nausea passed off, and the patient began to regain flesh. The sinus was treated by other means which it is not necessary here to specify, and is now completely closed.

Remarks.—The symptoms in the recorded cases of iodoform poisoning, although they vary considerably, have certain features in common which it is well to discriminate. Thus, in all there is pyrexia marked by extreme irregularity, the temperature running up to 104° F., or even more, and falling again very rapidly to near the normal; the rise invariably takes place in the evening, but the morning fall is nearly always out of proportion to the evening rise. Thus, in the case under notice, the temperature on the evening of the 11th May was 103.8° F., but fell the next morning to 99.4° F., to again rise the following evening to 102° . Again, on the 16th, evening, it was 102.6 , and the following morning it was normal; but again rose to 102.4° at night. The pulse is extremely rapid and feeble, its rapidity being in great measure independent of the rise of temperature—for in our case it was noted that the pulse beats were 140 per minute on the 13th, morning, when the temperature was normal. This marked effect upon the heart's action is interesting in view of Dr. Sidney Ringer's experiments with iodoform on the frog: he found that a fifth of a grain of the drug would almost arrest the action of the heart. Schede, in a paper in the *Centralblatt für Chirurgie*, refers to cases in which the pulse ran up to 180 without any rise of temperature, or any general symptoms beyond *malaise* and loss of appetite. Nausea, vomiting, and loss of appetite are invariable symptoms, the vomiting being persistent and very little relieved by treatment. In the case above detailed this symptom continued for more than a fortnight in spite of remedies, and the vomited matters were of viscid consistence and greenish colour. There is always lassitude, headache, and dulness of intellect, and often delirium, which in the worst cases passes into unconsciousness, or is followed by localised paralysis. The symptoms sometimes resemble those of acute meningitis, the patient uttering peculiar cries, rolling his eyes, and the headache being intense. Examples of such cases are referred to by Schede in the paper above-mentioned, and a case under the care of Mr. Marcus Beck is given in the *Brit. Med. Jour.* for 17th June. Zeissl describes two cases in which there was an eruption on the flexor aspects of the limbs, having

the appearance of erythema in the one, but in the other presenting the characters of urticaria; the eruption faded in the course of a few days after ceasing the use of the drug. In our case careful examination of the skin was made daily, but no eruption was observed, nor did we find any change in the urine, although in some recorded cases not only has it responded to the reaction for free iodine but albumen and epithelial tube casts have also been observed to be present. In a considerable number of instances a fatal result has ensued, but in several of these it has not been at all clear that the iodoform poisoning was really the cause of death. Mundy points out that "on minutely examining the cases of Mikulicz, Schede, König, Hoeftmann, and Czerny, it is found that many of the patients suffered from organic disturbances, only revealed by post-mortem, and which may have been the cause of death just as much as the iodoform." (Lond. Med. Rec., May, 1882.)

It is curious that although iodoform is so freely used in a great variety of conditions, and in patients of all ages and constitutions, it so seldom happens that constitutional effects are produced, and we are led to ask what are the circumstances which predispose to the absorption into the system, and the production of general symptoms. Mundy holds that the large quantity employed is the chief factor, and speaks of cases where from $2\frac{1}{2}$ oz. to 10 oz. have been applied at one dressing; certainly in our case we could not blame ourselves for the reckless employment of the drug, as only five grains were applied each alternate day. Another point, however, to be noted is the condition of surface to which it is applied; thus, on a free surface where a great deal of the iodoform is carried into or through the dressing by the discharge, the risk of absorption will be less than in a sinus, with only one external opening where the discharge is pent up and the iodoform may be retained for many days. Nor must it be forgotten that some granulating surfaces are more active than others in absorbing materials from without, healing burns being especially adapted for absorption, which may account for the number of fatalities where this drug has been employed in the treatment of burns. These considerations do not, however, account for all the cases of iodoform poisoning, nor can the plausible suggestion of a writer in the Brit. Med. Jour., that the action is cumulative, and that poisonous effects are only produced after long treatment, be entertained in view of the facts detailed as to the case under our observation. We are driven, indeed, however reluctantly, to the position held by Schede, that there is a peculiar idiosyncrasy rendering certain persons liable to constitutional effects from the local use of iodoform, and that it is therefore necessary in all instances

where it is used to carefully watch its effects, and cease its use whenever there is a distinct rise of temperature.—*Glasgow Medical Journal*, August, 1882, p. 81.

87.—PHYSIOLOGICAL WOUND TREATMENT.—SURGICAL AND ANTISEPTIC DRESSING CASE.

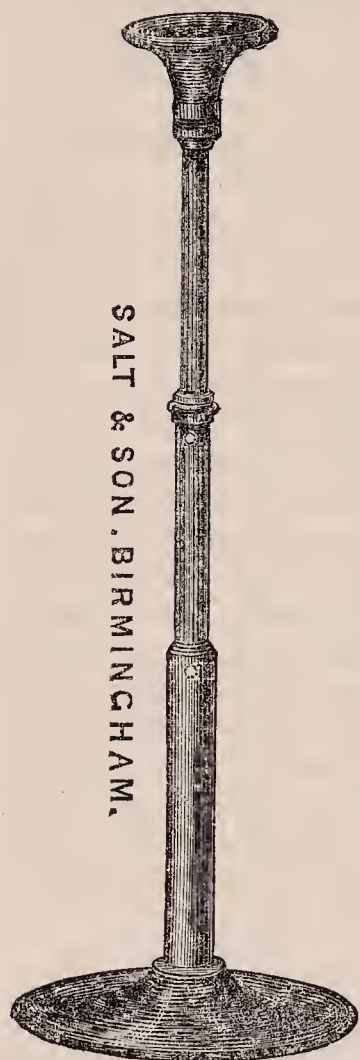
Mr. SAMPSON GAMGEE read a paper at the Medical Society of London (Nov. 6th) on the Unity of Surgical Principles in Wound and Fracture Treatment. Those principles he emphasised as immediate reduction or coaptation, immobility, position and pressure, with drainage and infrequent dressing. After the discussion, in which the President, Mr. Francis Mason, Dr. Richardson, F.R.S., Mr. William Adams, Mr. Thomas Bryant, and others expressed substantial concurrence with Mr. Gamgee's views, he exhibited an elegant and very handy Surgical Dressing-case, prepared for him by Messrs. Salt and Son, of Birmingham. It contains all that is necessary for treating surgical injuries on the most approved principles. Amongst its contents we note:—Absorbent and antiseptic pads and bandages (Southall's), emplastrum elemi, scissors, torsion forceps, sponges, measuring tape, needles, suture wire, catgut ligatures, catheters, camel-hair brushes, boro-glycerine, ether, styptic colloid, poro-plastic splintage, drainage tube, safety pins, tourniquet, tenax, Nelaton probe, bullet extractor, &c.

88.—THE DIAGNOSIS CASE.

This is a case containing the various Instruments and Appliances used in Diagnosis, and is a desideratum for every medical man whether he be consultant, specialist, or general practitioner. The following is a list of its contents:—Sims' vaginal speculum; three-nested Fergusson's specula; bivalve rectum speculum; nasal speculum; Laycock's spatula; ear syringe; urinometer and trial glass; vulcanite case each for tests, as caustic potash, cupric test, and nitric acid; three-nested ear specula; cystometer; spring measuring tape; stethoscope; ophthalmoscope; exploring trocar; Simpson's sound; male and female catheter combined; exploring sound; clinical thermometer; Thompson's sound and searcher; spirit lamp; with a vacant space for sundries.

The various articles are neatly arranged and securely packed in their places in a reticule case. It will be found equally useful in the consulting room, or may be carried with the practitioner on his round. The Diagnosis Case has been manufactured by Messrs. Salt and Son, Birmingham, at the suggestion of Mr. Wm. Thomas, surgeon, Birmingham.

89.—SALT AND SON'S NEW STETHOSCOPE.

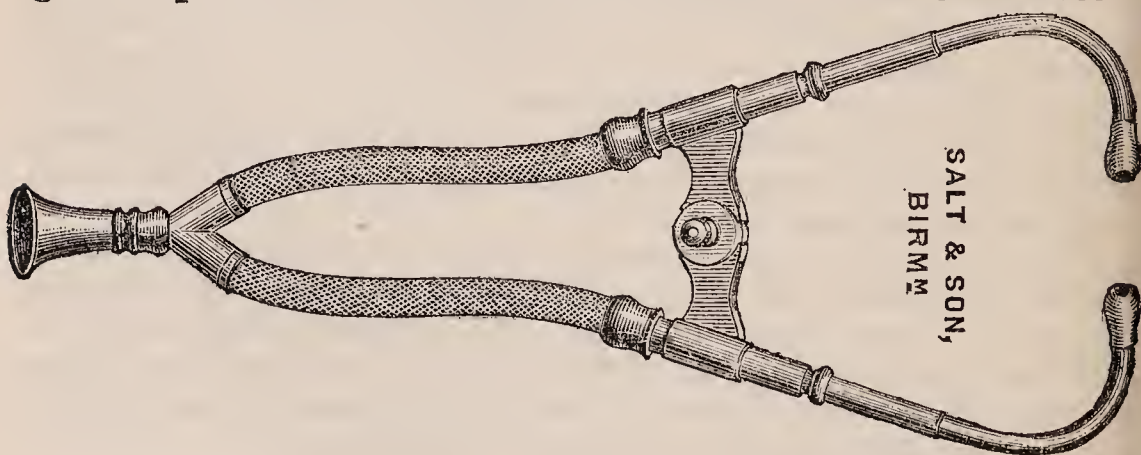


"The Stethoscope of which we give an engraving is the most portable which has come under our notice. Its extreme length, when fully extended, is that of an ordinary stethoscope, viz., seven inches, whilst it admits of being closed to five inches and a half, and three inches and three-quarters respectively; this is effected by two telescopic slides, which lock at the limit of extension by a simple bayonet-catch at each point of junction, by a single and slight movement to the right, whether one or both tubes be employed. The ear-piece is removable, and the instrument can be conveniently carried in the waistcoat pocket. The tubes are made of aluminium, and the mounts of celluloid in various colours, as amber, tortoise-shell, and coral.

"The stethoscope, shown to us by Messrs. Salt and Son, of Birmingham, is an improvement upon a somewhat similar one made by them with a single slide, a notice of which appeared in our columns. We may add that the conduction of sound is excellent, the price is exceedingly moderate, and the appearance very carefully brought up to an artistic standard."

90.—IMPROVED PORTABLE BI-AURAL STETHOSCOPE.

Messrs. Salt and Son, of Birmingham, have also produced an improved Bi-aural Portable Stethoscope, which, we think, is a great improvement. The instruments hitherto in use have been



very cumbrous, and a successful effort has now been made to obviate this defect. The lower part, or that next the chest of the patient, is exactly similar to the usual patterns, but the upper metallic parts which rest in the physician's ears are made to slide by a three-fold telescopic action, so as to occupy no greater length than $5\frac{1}{2}$ inches, whilst the tubes fit so closely that the acoustic property of the instrument suffers no detriment. Hence this stethoscope combines the clinical advantages of a bi-aural stethoscope with something more than the convenience of an ordinary one. (*Vide illustration*).

91.—NEW APPARATUS FOR TESTING FOR ALBUMEN IN URINE.

By GEORGE P. BEST, B.A., M.B. Cantab., M.R.C.S., Birmingham.

Messrs. Salt and Son, of Birmingham, have arranged, at the suggestion of Mr. Best, an apparatus for the utilisation in clinical practice of a new mode of applying the nitric acid test for albumen in urine. He claims that by his method, which depends on the syringe or suction principle, all those conditions which have to be observed in using the test-tube are more simply and perfectly attained, the lighter fluid being first drawn up, and then the heavier, so that their surfaces are brought into apposition without mixing them. In this case the slow process of diffusion suffices to effect in the layer of urine adjacent to the nitric acid that change which the tester seeks—and, as the contact between the two fluids is provided for without agitation of either, the albuminous film, when present, is rendered as dense and well-marked as it possibly can be. Again, no confusion can arise from the line of lithates which frequently presents itself, as the nitric acid (which is drawn up last), gets no chance of coming in contact with that part of the urine where this line is developed.

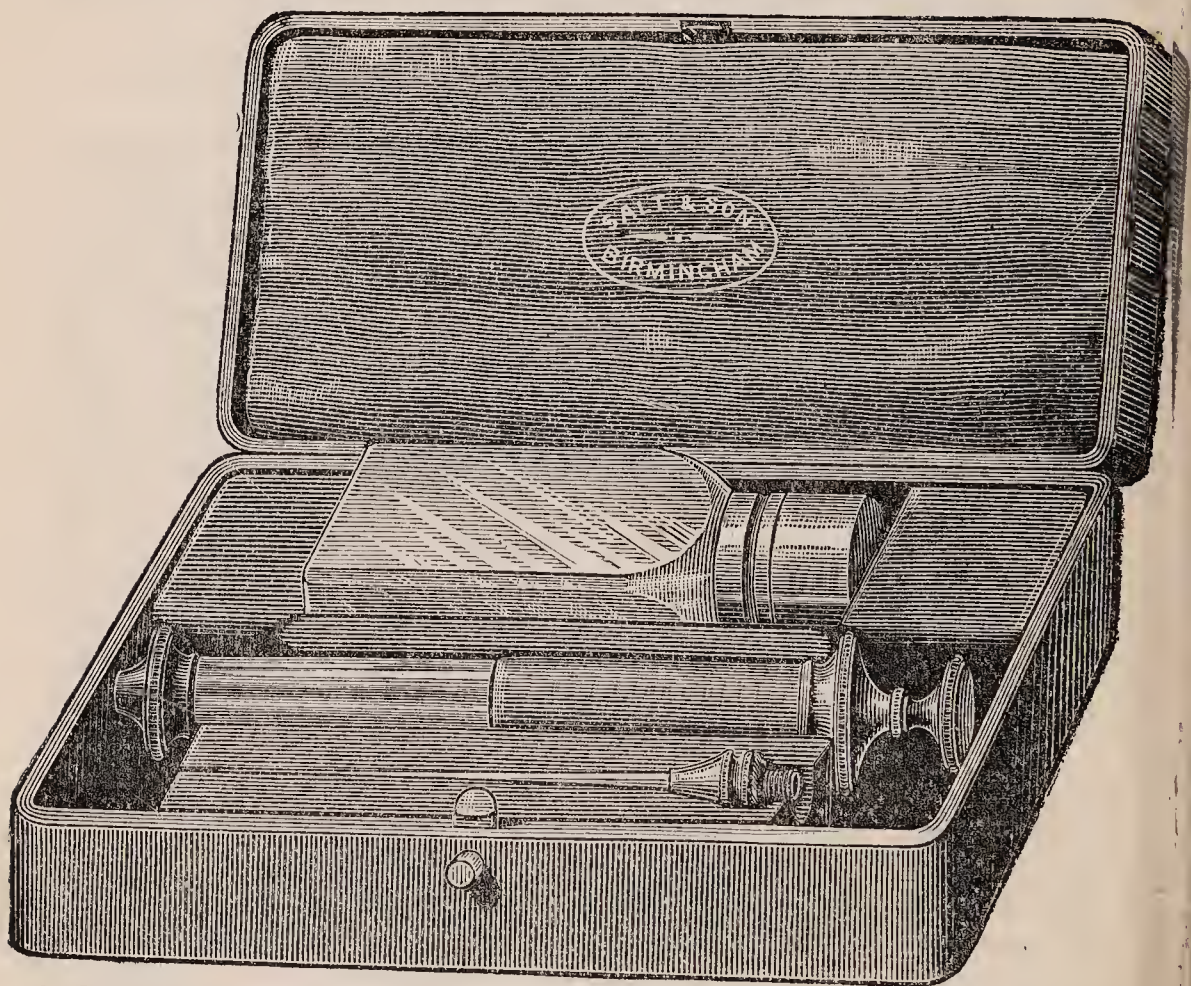
For use in private practice, where the medical man usually has the urine which he wishes to test presented to him in that most unmanageable of all vessels—the chamber-pot—the apparatus will be found specially convenient. A few drops (and sometimes this is all that is procurable) may be easily drawn up from the clearest part of the contents of the voluminous utensil, and submitted to the necessary examination.

The instrument is easily cleansed by drawing in and squirting out a little water, and all dripping of either liquid is provided against in the length and bore of the nozzle.

It is neatly packed in a handy case (*vide woodcut*), which also contains a bottle for a test-fluid. Mr. Best recommends for this purpose Dr. Roberts' hydrochloric solution of sodium chloride. If the practitioner wishes nitric acid he had better take it in a

separate bottle, or have it kept at the house of his patient. Dr. Roberts' solution, however, answers so perfectly that this will not be necessary. Whatever superiority Mr. Best's method has in dealing with nitric acid is intensified in the case of the hydrochloric solution, the reaction of which with albuminous urine, as exhibited with his syringe, is so sharply defined, that it leaves nothing to be desired.

Dr. Roberts' directions for using this test will be found at page 142, where he says: "One of the chief advantages of the salt test is its incorrosive character. It does not stain nor burn



holes in garments and carpets, nor fleck the hands with yellow spots. The use of it makes it possible to arrange a pocket-case for urine testing that shall not be a terror to the wearer. From this point of view the substitution of the salt solution for nitric acid will be a real boon to practitioners. The salt test has this additional convenience—that it enables us to test successively for albumen and sugar on one and the same sample of urine."

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